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ECOLOGICAL RESOURCES SURVEY OF THE JAMESTOWN NORTH AREA

PERRY COUNTY, ILLINOIS

By

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June 1979

Sponsored by Consolidation Coal Company

Submitted by

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PREFACE

This report was prepared at the request of Consolidation Coal Company as part of its procedure to obtain permits allowing the expansion of the Burning Star No. 4 Mine in Perry County, Illinois. The content of this report is for the sole use of Consolidation Coal Company and copying or duplication of any part of this report is not allowed without consent of the company.

ACKNOWLEDGEMENTS

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INTRODUCTION

Consolidation Coal Company (Consol) plans to expand its mining operations north of its Burning Star No. 4 Mine. Major activities of this action include: opening a new reserve field north of Jamestown in Perry County, Illinois; diverting the portion of Galum Creek that flows through this area; and construction of haulage roads to the existing preparation plant.

The project area, known as the Jamestown North Area (JNA), comprises approximately 2,600 acres. It is composed primarily of a mixture of croplands, pasture and secondary forest. The area is situated entirely within Perry County and is bordered by Illinois Routes 150 and 154 and county roads (T5S, R4W, Sections 21, 28 and portions of 22, 27, 33, and 34). This study covered the period of 4 May to 22 June 1979. Actual fieldwork was conducted 14 May to 1 June.

Objectives

The principal objectives of this study were to: 1) describe and map major land-use types within JNA; 2) list potential and actual terrestrial and aquatic features on the site including fauna and flora; and 3) evaluate the relative importance of ecological resources on the site in comparison to surrounding areas. Because of time constraints, this study was mostly qualitative with some quantification regarding acreages of land-use types and vegetation sampling.

METHODS

The emphasis of this study was on assimilating existing data and gathering qualitative information on the ecological resources of the JNA. Several sources were used to identify species found and to derive lists of potential species present: Mohlenbrock and Voigt (1959, 1964) for plants; Smith (1961) for amphibians and reptiles; Smith (1979) for fish; Robbins et al. (1966) and Kleen and Bush (1971) for birds; Hoffmeister and Mohr (1957) for mammals and Pennak (1953) for invertebrates. Throughout, potential species are those which may occur within the land-use type of JNA as determined by distributional lists in these references. Commonly associated species are ones typically thought to inhabit particular land-use types or habitats within southern Illinois; also based on habitat descriptions and distributions in the above references.

Terrestrial Communities

Soils

The soils map of the area included in this report was provided by Consol. Acreages of soil types were determined from this map through the dot grid transparent overlay method (Bryant 1943).

Land-use Types

A land-use map was prepared from a 1977 aerial photograph of the JNA provided by Consol. Nine land-use types were identified through photo-interpretation and on-site verification: cropland or tilled areas, pasture, old field, forest, hedgerow, riparian, buildings and farmsteads, ponds, and roads. Hedgerows were defined as woods less

than 100 feet wide. Acreages of land-use types were determined using the dot grid transparent overlay system (Bryant 1943). Because creeks were not clearly visible on aerial photographs, linear distances of creeks and tributaries were measured from a USGS topographic map. Although some land-use types could contain more than one microhabitat, the qualitative methods used in this study did not permit clear distinction of habitats within land-use types. Thus the terms land-use and habitat types will be used interchangeably within this report.

Floral Composition

Dominant plant species and their relative abundances were determined for five habitat types: upland forest, lowland and riparian forests, oldfield, hedgerow and cropland. Lowland and riparian forests overlapped extensively and one transect was used to sample both. Vegetation less than 10 ft in height was measured using the line intercept method along a 500 ft transect in each habitat type; vegetation more than 10 ft was measured with the point-quarter method (Cox 1972). Species found within habitats but not on transects were noted.

Faunal Composition

All amphibians and reptiles observed during field work were identified ; representative anurans and salamander larvae were collected. Three sunrise censuses for birds were conducted along vegetation transects in lowland and upland forests, old field and hedgerow using the Forbes-Gross strip census technique (Graber and Graber 1963). Incidental birds were noted throughout the study. Mammals were determined by direct observation of live and road-killed animals, by den sites or other signs. Three nights of small mammal trapping were conducted using 20 snap traps set along vegetation transects in each habitat type except cropland.

Aquatic Communities

Aquatic habitats were sampled at three sites on Galum Creek, four tributaries of the creek and five ponds (Fig. 1). At each site, three bottom samples for benthic invertebrates were taken with an Eckman dredge and approximately 30 ft of shoreline were sampled with a dip net. Samples were seived through a #30 seive, preserved and identified to lowest practical level.

At each site, except lower Galum Creek which was too deep, fishes were sampled with at least three sweeps of either a 5 by 30 ft or 4 by 20 ft seine. Each sample site was visually surveyed for prominent vegetation and for dens, tracks or other evidence of aquatic-related mammals.

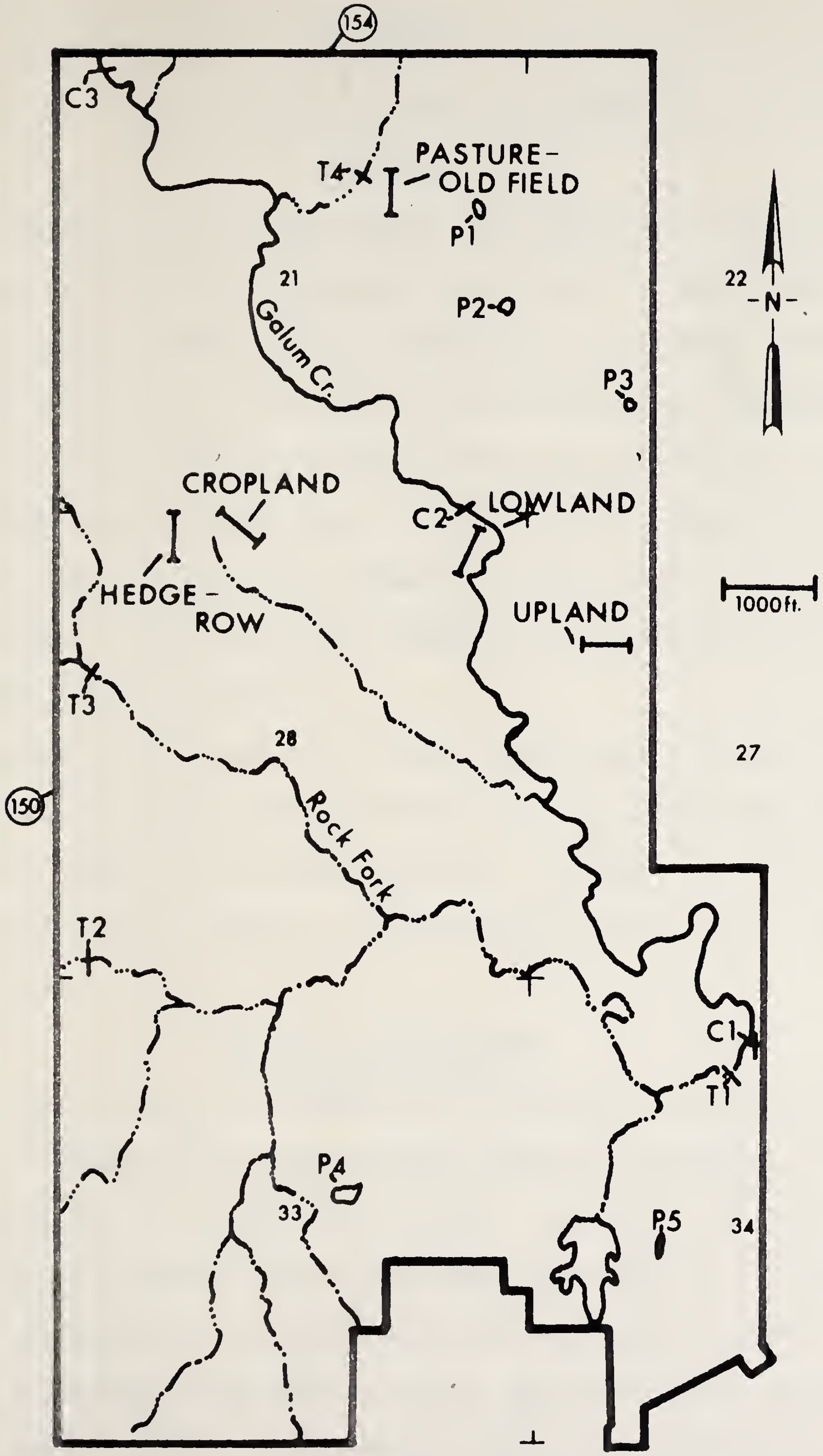

Figure 1. Location of vegetation analysis transects and aquatic sampling sites (C=Creek, T=Tributary, P=Pond) on Jamestown North Area, T5S, R4W, Perry County, Illinois.

RESULTS

General Characteristics of the JNA

Land Use

The JNA consists of cropland (58%) interspersed with forest (28%), pasture-old field (10%) and hedgerows (3%) (Table 1). Galum Creek flows from the northwest corner to the southeast edge of the area for approximately 3.8 miles (Fig. 1). Most of the forested land is adjacent to and includes the creek; and, approximately 8 miles of tributaries. All of these tributaries had flowing water at the time of the study. Later in the summer, however, they would probably become dry creek beds or intermittent streams. Galum Creek and tributaries are characterized by steep, muddy banks and silty bottoms.

Ten ponds were located on the area; all but one, a large impoundment utilized as a fresh water source for the coal processing plant of the Burning Star Mine, were farm ponds less than 1 acre in size. There were 11 farmsteads (land occupied by farm buildings) and several dirt and gravel roads.

Geology and Topography

The JNA is within the Southern Till Plain natural division of Illinois (Schwegman 1973) which contains bedrock of sandstone, limestone, slate and coal of the Pennsylvanian system. The retreat of the Illinoisan glacier that covered this region left deposits of glacial till which were subsequently covered by loess blown from the west (Harris et al. 1977).

The topography of the JNA is level to gently rolling. The steep banks of Galum Creek and tributaries are within a broad floodplain which gradually rises to level uplands. The highest elevation is 480 ft above sea level; the lowest is 430 ft.

Table 1. Major land-use types in Jamestown North Area.

Land-Use Type	Area (acres)	Percent of Total
Cropland	1492	58.2
Forest	713	27.8
Pasture-Old Field	248	9.7
Hedgerow	80	3.1
Farmstead	14	0.5
Ponds	11	0.4
Roads	7	0.3
TOTAL	2565	100.0

Climate

Perry County, which includes JNA, has a humid, temperate climate with an annual mean temperature of 57° F. Approximately 40 in of precipitation falls annually and the frost-free period averages 186 days (Mills et al. 1967).

Soils

The soils of the JNA (Table 2) are of three basic associations: those developed under prairie vegetation or uplands; those formed under forest or uplands; and bottomland soils formed from alluvium (Ferhenbacker et al. 1967). Soils of the first association include the Cisne, Hoyleton and Richview series which occur on nearly level to gently sloping uplands covering about 29% of the study area. Although some drainage and erosion problems exist, these soils are considered prime farmland by the Soil Conservation Service except for slopes greater than 5%. These soils with amendments are moderately productive for corn, soybeans, wheat and hay and are almost entirely in cultivation.

Soils of the second association, Blair, Hickory, Bluford and Ava, occupy about 32% of the JNA, with an additional 12% being sharply sloping soils of the Hickory-Ava complex. These soils are on level to steep uplands and occur between the first association and bottomland soils. Drainage, fertility and especially erosion are problems; only a small fraction is considered prime farmland. These soils are moderately productive under intensive management for corn, wheat, soybeans and hay although steeper slopes should be pasture or forest. On the JNA, most are cultivated with some in pasture and forest.

Bottomland soils, the third association, include the Belknap series which are level to gently sloping and occur in the floodplain of Galum

Table 2. Soil types, characteristics, and acreages for the Jamestown North Area.

Soil Type	Percent Slope	Capability Unit	Degree of Erosion	Prime Farmland	Approximate Acreage	Percent of Total Area
Cisne Silt Loam	0- 2	IIIw	-	x(1)	250	9.3
Hoyleton Silt Loam	0- 3	IIw	-	x	30	1.1
Hoyleton Silt Loam	3- 6	IIe	Eroded	x	390	14.6
Richview Silt Loam	5-10	IIIe	Eroded	-(2)	100	3.7
Blair Silty Clay Loam	10-18	VIe	Severely Eroded	-	10	0.4
Hickory Loam	18-30	VIe	-	-	30	1.1
Wynoose Silt Loam	0- 2	IIIw	-	-	90	3.4
Bluford Silt Loam	0- 3	IIw	-	x	20	0.7
Bluford Silt Loam	3- 6	IIe	Eroded	-	380	14.2
Ava Silt Loam	1- 5	IIe	-	x	20	0.7
Ava Silt Loam	5-10	IIIe	Eroded	-	300	11.2
Ava Silty Clay Loam	5-10	IVe	Severely Eroded	-	120	4.5
Belknap Silt Loam	0- 3	IIw	-	0(3)	570	21.3

Table 2. Continued.

Soil Type	Percent Slope	Capability Unit	Degree of Erosion	Prime Farmland	Approximate Acreage	Percent of Total Area
Darmstadt Silt Loam	0- 3	IVe	-	-	10	0.4
Hickory-Ava Complex	10-18	IVe	-	-	270	10.1
Hickory-Ava Complex	10-18	VIe	Severely Eroded	-	60	2.2

(1) Does qualify for prime farmland.

(2) Does not qualify for prime farmland.

(3) Qualifies for prime farmland if flooding is less frequent than once in 2 years during the growing season.

Creek and tributaries. Although moderate to high yields are possible, flooding and drainage can be severe problems. These soils are suited to corn, soybeans, wheat, oats, hay and pasture but are especially good for timber production. On the JNA most are covered by forest with some in cultivation.

Habitats of the JNA

Cropland

Croplands provide feeding areas for insectivorous and granivorous animals in spring as well as limited breeding areas for agriculturally related wildlife (e.g. mourning doves, pheasants, some snakes, small rodents) after crops have emerged. Within the JNA cropland comprised approximately 1500 acres and was the largest land-use type. It consisted of fields ranging from 20 to 80 acres (mode, 40 acres) that had been planted in corn, wheat and soybeans. Farmsteads were usually adjacent to cropland; both land-use types were bordered by upland and lowland forests and/or hedgerows.

Vegetation

At the time of the study no tilled fields had been planted and vegetation was sparse. Predominant species were "invaders" that typically occur in first-year fallow fields in southern Illinois. In this land-use type, 44 plant species were recorded (APPENDIX A); common ragweed, common foxtail and wild onion were most important as based on percent vegetative cover (Table 3).

Mammals

Number of species which may occur: 9

Rare or endangered species which may occur: None

Species commonly observed or associated: Eastern mole, raccoon, red fox, white-tailed deer, woodchuck, deer mouse.

Table 3. Dominant vegetation[1] of cropland transect, Jamestown North Area.

Species[2]	Percent Composition
Common Ragweed	33.0
Common Foxtail	28.6
Wild Onion	17.4
Smartweed	8.0
White Speedwell	5.0
Bluegrass	3.2
Red Clover	1.6
Golden Ragwort	1.4
Yellow Rocket	0.9
Beggar's Tick	0.7
White Clover	0.2

[1] Vegetation was all ground cover, 0 to 1 ft , covering 29.0% of the transect.

[2] Scientific names in Appendix A.

The lack of suitable cover precluded most mammals from using this area in early spring. Only woodchucks were observed during the study. Tracks of raccoons and white-tailed deer indicated that these mammals ventured into croplands (Table 4).

Birds

Number of species which may occur: 40

Rare or endangered species which may occur: Upland sandpiper, loggerhead shrike, Brewer's blackbird.

Species commonly observed or associated: Common grackle, horned lark, dark-eyed junco, mourning dove, starling, rough-winged swallow, barn swallow, killdeer, bobwhite, common crow, red-winged blackbird, indigo bunting, turkey vulture, red-tailed hawk.

Twenty species of birds were observed using croplands. Of these, five (bobwhite, killdeer, barn swallows, red-winged blackbirds and indigo buntings) were common (Table 5). Most other species were seen flying over the area but some such as mourning doves fed on the ground. Many migrants, especially blackbirds and gulls potentially use croplands for feeding. Killdeer often nest in open fields and red-winged blackbirds and mourning doves nest along edges.

The threatened loggerhead shrike was observed once within but at the periphery of the JNA. Its breeding status, therefore, was unknown.

Amphibians and Reptiles

Number of species which may occur: 9

Rare or endangered species which may occur: None

Species commonly observed or associated: Fowler's toad, American toad, eastern box turtle, black racer.

Ditches and low areas contained water at the time of the study and provided ephemeral breeding areas for frogs and toads. Box turtles, toads and black racers occasionally inhabit drier fields. Other species

Table 4. Mammals found within Jamestown North Area[1,2].

Species	C[3]	F	OF	H	B	P	R	Comments
Opossum		X						
Eastern Mole	S	S	S	S				
Short-tailed shrew				X				
Raccoon	S	S	S	X		S	S	
Mink							S	
Red fox	S	S						den found
Domestic dog	S		S		X			
Woodchuck	X	S		S				dens found
Eastern chipmunk		X		X				nest found
Eastern gray squirrel				X				
Eastern fox squirrel				X				
Beaver							S	
Deer mouse				1				nest found
White-footed mouse		1		6				nest found
Southern bog lemming			1					
Prairie vole			1					
Muskrat						S	S	den found
Eastern cottontail			S	X	X			
White-tailed deer	S	S	S	S				

---

[1] Scientific names in Appendix E.

[2] Symbols: X = direct observation; S = sign only; numbers are animals snap trapped.

[3] Headings: C = Cropland; F = Forest; OF = Pasture-Old Field; H = Hedgerow-Edge; B = Buildings-Farmsteads, P = Ponds; R = Riparian.

Table 5. Birds found within Jamestown North Area[1,2].

Species	C^3	F	OF	H	B	P	R	Comments
Green heron						X		
Mallard			X			X		
Turkey vulture	X	X						
Red-tailed hawk	X	X		X				
American kestrel	X							
Bobwhite	C		C,T	C,T				
Killdeer	C							
Rock dove					X			
Mourning dove	X		T		X			
Yellow billed cuckoo		T	C,T					
Chimney swift		X			X			
Ruby-throated hummingbird			X	X				
Common flicker		X		X				
Pileated woodpecker		X						
Red-bellied woodpecker		T						
Red-headed woodpecker	X	T				X	C	
Hairy woodpecker		T						
Downy woodpecker		X						
Eastern kingbird			C	X		X		
Great crested flycatcher							X	
Eastern phoebe					X		X	nest found
Acadian flycatcher		T					X	nest found
Least flycatcher		T		X				
Eastern wood peewee		T		X				

Table 5. Continued.

Species	C^3	F	OF	H	B	P	R	Comments
Prairie horned lark	X							
Tree swallow	X							
Rough-winged swallow	X							
Barn swallow	C				C	X		nest found
Blue jay		T						
Common crow	X	T						
Carolina chickadee				X				
Tufted titmouse		X		X				
White-breasted nuthatch		T					X	
House wren							X	nest found
Gray catbird		T		C,T		X		
Brown thrasher				X				
American robin		X						
Wood thrush		T						
Swainson's thrush		T						migrant
Blue-gray gnatcatcher		T		X				
Cedar waxwing				X				
Loggerhead shrike	X							threatened
Starling		X						
White-eyed vireo			T	C				
Bell's vireo			T					
Yellow-throated vireo		X						
Red-eyed vireo		C,T						

Table 5. Continued.

Species	C[3]	F	OF	H	B	P	R	Comments
Warbling vireo				X				
Tennessee warbler				X				migrant
Parula warbler		X		X				
Yellowthroat			T	C				
Yellow-breasted chat			X	X				
Wilson's warbler			X					migrant
House sparrow	X	X						nest found
Eastern meadowlark	X							
Red-winged blackbird	C		C,T	C	X	C		nest found
Common grackle		X			X			
Brown-headed cowbird	X	T	X	X			X	eggs found
Scarlet tanager				X				
Cardinal		T	T	C				
Rose-breasted grosbeak				X				migrant
Indigo bunting	C	C,T	X	C,T		X		
Dickcissel	X							
American goldfinch					X			
Rufous-sided towhee			C,T	X				nest found
Field sparrow	X		C,T	X				nest found

[1] Scientific names for residents in Appendix D.

[2] Symbols: X = observed in habitat; T = found along transect;
C = common in habitat.

[3] Headings: C = Cropland; F = Forest; OF = Pasture-Old Field; H = Hedgerow-Edge;
B = Buildings-Farmsteads, P = Ponds; R = Riparian.

would probably use cultivated fields after crops have provided cover. Six species were observed in this land-use type (Table 6).

Forests

Forests on the JNA were divided into upland and lowland types. Upland forests included about a third of the wooded areas, and had well-drained soils. Lowland and riparian forests occupied floodplains of Galum Creek and tributaries and had moderate to poor drainage. Because these forest types could not be distinguished on aerial photographs, total area was combined. Together they covered approximately 700 acres and were the second largest land-use type.

Lowland and Riparian Forests

Vegetation

The lowland and riparian forests were characterized by a late successional canopy, sparse understory and dense ground cover. A total of 54 plant species was found (APPENDIX A). Dominant trees included box elder, sugar maple, river birch and silver maple. An average of 355 trees/acre was estimated from the transect data (Table 7). Several dead or diseased trees could provide sites for cavity nesting animals. Few commercially valuable species except black cherry were found.

The understory was represented by only two species on the transect; 27 species were found in the ground cover (Table 8). Of these, stinging nettle, jewel-weed, cream violet and buttercup were the most extensive. All species are common in southern Illinois.

Mammals

Number of species which may occur: 29

Rare or endangered species which may occur: Indiana bat, gray bat.

Species commonly observed or associated: Opossum, shorttail shrew,

Table 6. Amphibians and reptiles found within Jamestown North Area[1].

Species	C[2]	F	OF	H	P	R	Comments
AMPHIBIANS							
Tiger Salamander					X		larvae only
American toad	X						adults and young
Fowler's toad	X						
Cricket frog	X				X	X	breeding
Chorus frog					X		breeding
Leopard frog	X				X		
REPTILES							
Common snapping turtle						X	
Eastern box turtle	X	X	X				
Painted turtle					X		adults and young-of-year
Red-eared turtle					X	X	
Northern fence lizard		X					
Five-lined skink		X					
Black racer	X		X				
Eastern garter snake				X			
Yellow-bellied water snake						X	
Midland brown snake						X	
Midland water snake						X	

---

[1] Scientific names in Appendix C.

[2] Headings: C = Cropland; F = Forest; OF = Pasture-Old Field
H = Hedgerow; P = Ponds; R = Riparian; X = species observed in habitat.

Table 7. Dominant overstory vegetation[1] of lowland-riparian forest transect, Jamestown North Area.

Species[2]	Percent Composition	Density #/Acre	Average DBH Inches
Box Elder	37.7	134	8.2
Sugar Maple	22.3	79	6.7
River Birch	12.4	44	11.2
Silver Maple	7.3	26	12.2
Hackberry	2.5	9	8.3[3]
Sourgum	2.5	9	8.0[3]
Pin Oak	2.5	9	3.5[3]
Wild Black Cherry	2.5	9	10.5[3]
Honey Locust	2.5	9	23.6[3]
Shingle Oak	2.5	9	4.5[3]
Green Ash	2.5	9	14.0[3]
Sycamore	2.5	9	17.5[3]

[1] Over 10 ft high and DBH greater than 2.5 in.

[2] Scientific names in Appendix A.

[3] Only one in sample.

Table 8. Dominant vegetation under 10 ft of lowland-riparian forest transect, Jamestown North Area.

Species[1]	Percent Composition
GROUND COVER:[2]	
Stinging Nettle	31.0
Jewel-Weed	12.6
Cream Violet	12.3
Buttercup	8.7
Green Ash	4.4
Sedge	4.2
Poison Ivy	3.6
Virginia Creeper	2.9
Sweet-Scented Bedstraw	2.4
Bottlebrush Grass	2.4
Blue-Eyed Mary	2.1
Violet	2.0
Fowl Manna Grass	1.9
Virginia Cowslip	1.6
Common Blue Violet	1.3
Wild Onion	1.2
Cat Brier	1.1
Slippery Elm	1.1
Spicebush	0.6
Box Elder	0.6
Gray's Sedge	0.5
Water Hemlock	0.5

Table 8. Continued.

Species[1]	Percent Composition
Self-Heal	0.5
Hackberry	0.3
Goldenrod	0.2
Japanese Honeysuckle	0.2
Blue Phlox	0.1
UNDERSTORY:[3]	
Green Ash	83.3
Spicebush	16.7

[1] Scientific names are in Appendix A.

[2] Vegetation, 0 to 1 ft. high, covered 78.6% of transect.

[3] Vegetation, 1 to 10 ft. high, covered 6.0% of transect.

little brown bat, big brown bat, raccoon, gray fox, eastern gray squirrel, eastern fox squirrel, eastern chipmunk, southern flying squirrel, white-footed mouse, white-tailed deer.

The combination of lowland forest, riparian woodland and stream banks offered a variety of habitats to semi-aquatic, arboreal and aerial mammals. However, only raccoons were observed (Table 4). Mink and muskrat sign consisted of tracks and the presence of beaver was determined from old wood cuttings.

Birds

Number of species which may occur: 64

Rare or endangered species which may occur: Cooper's hawk, brown creeper, red-shouldered hawk.

Species commonly observed or associated: Woodpeckers, red-tailed hawk, green heron, great crested flycatcher, Acadian flycatcher, swallows, tufted titmouse, blue-gray gnatcatcher, yellow-throated vireo.

Riparian and lowland forests provided nesting sites for numerous bird species. Abundant natural cavities, snags and dead trees provided habitat for woodpeckers, chickadees, nuthatches, tree swallows and others. Species observed included red-headed woodpecker, great crested flycatcher, eastern phoebe, Acadian flycatcher, least flycatcher, barn swallow and white-breasted nuthatch (Table 5).

Amphibians and Reptiles

Number of species which may occur: 16

Rare or endangered species which may occur: None

Species commonly observed or associated: Spotted salamander, American toad, chorus frog, wood frog, eastern box turtle, midland painted turtle, water snakes.

Parts of Galum Creek, its tributaries and adjacent woodland depressions provided breeding sites for several amphibians and permanent habitat for frogs. Reptiles, including snakes, turtles and skinks could

be found along banks and within the forest. Three species of turtles were observed in Galum Creek or along its banks (Table 6).

Upland Forest

Vegetation

Unlike the lowland forest which yielded only two distinct strata, the upland forests had well-developed canopy, understory and ground cover; 51 species were found (APPENDIX A). The canopy was dominated by pignut, sweet pignut and shag-bark hickories and white oak. Oaks and hickories were the most numerous species of marketable size but several ash and elm trees were present. An average of 432 trees/acre was estimated from the transect, somewhat more than in lowland forests (Table 9).

The understory covered 70.8 percent of the available area and was dominated by slippery elm, green ash and mulberry (Table 10). Ground cover species occupied 48% of the area. Dominant species included Mayapple, Virginia creeper and slippery elm.

Mammals

Number of species which may occur: 26

Rare or endangered species which may occur: Indiana bat, gray bat.

Species commonly observed or associated: Shorttail shrew, gray fox, eastern chipmunk, eastern gray squirrel, eastern fox squirrel, white-footed mouse, southern flying squirrel.

Direct observations or sign of eight mammals were observed in the upland forest (Table 4). Tunnels of eastern moles and droppings of white-tailed deer were numerous throughout the area. A den thought to belong to a red fox was located but no young were observed. Trapping of one white-footed mouse produced a trapping success of 1.7 animals/100 trap-nights.

Table 9. Dominant overstory vegetation[1] of upland forest transect, Jamestown North Area.

Species[2]	Percent Composition	Density #/Acre	Average DBH Inches
Pignut Hickory	27.3	118	7.8
Sweet Pignut Hickory	17.4	75	5.6
Shagbark Hickory	15.0	65	6.0
White Oak	15.0	65	8.5
Green Ash	7.4	32	3.1
Slippery Elm	5.1	22	3.0
Red Bud	5.1	22	2.9
Red Oak	2.5	11	20.1[3]
Black Oak	2.5	11	14.3[3]
Sugar Maple	2.5	11	3.2[3]

[1] Over 10 ft high and DBH greater than 2.5 in.

[2] Scientific names in Appendix A.

[3] Only one in sample.

Table 10. Dominant vegetation under 10 ft of upland forest transect, Jamestown North Area.

Species[1]	Percent Composition
GROUND COVER:[2]	
Mayapple	48.8
Virginia Creeper	22.4
Slippery Elm	20.0
False Solomon's Seal	2.4
Red Trillium	1.4
Green Dragon	1.4
Green Ash	1.2
White Dog-Toothed Violet	1.0
Common Cinquefoil	0.6
Wild Black Cherry	0.4
Sweet-Scented Bedstraw	0.2
UNDERSTORY:[3]	
Slippery Elm	53.4
Green Ash	18.4
Red Mulberry	16.9
Red Bud	8.5
Shagbark Hickory	2.8

[1] Scientific names in Appendix A.

[2] Vegetation 0 to 1 ft high covered 40.8% of transect.

[3] Vegetation 1 to 10 ft covered 70.8% of transect.

Birds

Number of species which may occur: 50

Rare or endangered species which may occur: Sharp-shinned hawk, Cooper's hawk, yellow-bellied sapsucker, Bewick's wren, veery, solitary vireo, Nashville warbler.

Species commonly observed or associated: Common grackle, blue jay, tufted titmouse, Carolina chickadee, red-eyed vireo, indigo bunting, woodpeckers, cardinal.

Upland forest in the JNA had similar habitats and avian species as many forests in southern Illinois. In comparison to other habitats on the JNA, a relatively diverse avian community was found (Table 5); 20 species were seen along the transect and 7 were seen during almost every trip. All species recorded were common residents or migrants in southern Illinois.

Amphibians and Reptiles

Number of species which may occur: 21

Rare or endangered species which may occur: Eastern ribbon snake.

Species commonly observed or associated: Eastern box turtle, northern fence lizard, five-lined skink, Fowler's toad, black rat snake, American toad.

Drier conditions in upland forests favored woodland salamanders, lizards and snakes. Although only three species of reptiles were found (Table 6); others probably occurred in the area.

Pasture - Old Field

Three small pastures held horses and pigs; others were fallow and reverting to old fields. These habitats could not be distinguished on aerial photographs and total acreage was combined. Pastures and old fields comprised approximately 10% of the JNA. Old fields were usually well-drained upland sites bordered by forests or hedgerows. A few old fields in lower areas had sparse vegetation due to recent flooding.

Table 11. Dominant vegetation[1] of pasture-old field transect, Jamestown North Area.

Species[2]	Percent Composition
Meadow Fescue	43.4
Common Cinquefoil	25.5
Goldenrod	11.0
Red Top	7.8
Dewberry	3.3
Common Blackberry	2.2
Slender Mountain Mint	1.5
Sedge	1.2
White Avens	0.6
Swamp Agrimony	0.6
Mayapple	0.6
Milfoil	0.5
Post Oak	0.4
Shingle Oak	0.3
Violet	0.3
Honey Locust	0.2
Bedstraw	0.2
Red Oak	0.2
Milkweed	0.2

[1] Vegetation was all ground cover, 0 to 1 ft, covering 82.4% of the transect.

[2] Scientific names in Appendix A.

Vegetation

Vegetation within these habitats was characterized by forbs and grasses interspersed with blackberries, dewberries, other small shrubs and scattered saplings (Table 11). Only a few dominant species including meadow fescue, common cinquefoil and goldenrod were identified; but, 15 other species were found along the transect and 46 species were recorded as incidentals (APPENDIX A).

Mammals

Number of species which may occur: 12

Rare or endangered species which may occur: None

Species commonly observed or associated: Eastern mole, eastern red fox, deer mouse, prairie vole, eastern cottontail, white-tailed deer, raccoon, opossum, woodchucks.

Old field habitats provide daytime bedding sites for white-tailed deer and feeding areas for cottontails and granivorous mammals. Old fields are considered preferred habitats by deer mice, prairie voles and bog lemmings. Small mammal trapping success was 3.3 animals/100 trap-nights with one bog lemming and one prairie vole caught (Table 4).

Birds

Number of species which may occur: 31

Rare or endangered species which may occur: Common snipe, loggerhead shrike, Bewick's wren, Bachman's sparrow.

Species commonly observed or associated: Common grackle, starling, bobwhite, yellow-billed cuckoo, eastern kingbird, red-winged blackbird, rufous-sided towhee, field sparrow.

The diversity of upland and lowland old-field habitats and pastures provided nesting and feeding areas for fringillids, bobwhites, blackbirds and grackles (Table 5). Red-winged blackbirds were most common near poorly drained areas. Yellow-billed cuckoos primarily used forest - old

field edges where insect larvae were abundant. A total of 17 species was recorded.

Amphibians and Reptiles

Number of species which may occur: 14

Rare or endangered species which may occur: None

Species commonly observed or associated: Eastern box turtle, black racer, Fowler's toad, eastern garter snake.

The generally well-drained soil of upland old fields provided poor habitat for most amphibians but favored some species of snakes and Fowler's toad. Only eastern box turtles and black racers were observed (Table 6).

Hedgerow-Edge

Although hedgerows and edges occupied only 80 acres or 3% of the JNA, their importance to wildlife is greater than suggested by total acreage. Hedgerows are long ribbons of edge that contain species from adjacent habitats as well as species typically associated with ecotones. Therefore, hedgerows and other edges are frequently more diverse than would be expected from observations of adjacent land-use types. Most hedgerows in the JNA jutted in to cropland and edge occurred at borders of all land-use types.

Vegetation

Hedgerow and edge flora could be divided into woody vegetation and herbaceous species. Herbaceous vegetation was thickest along the periphery of hedgerows and included Japanese honeysuckle, goldenrod and poison ivy (Table 12). Dominant woody species were hackberry, shingle oak and osage orange (Table 13). Besides the plants observed along the transect, 59 species were identified (APPENDIX A).

Table 12. Dominant herbaceous vegetation of hedgerow transect, Jamestown North Area.

Species[1]	Percent Composition
Goldenrod	28.5
Japanese Honeysuckle	27.6
Poison Ivy	24.1
Dewberry	9.7
Meadow Fescue	6.5
Common Ragweed	1.7
Wild Onion	0.6
Red Clover	0.5
Yellow Wood Sorrel	0.3
Goose Grass	0.3
Virginia Wild Rye	0.2

[1] Scientific names in Appendix A.

Table 13. Dominant woody vegetation of hedgerow transect, Jamestown North Area.

Species[1]	Percent Composition
Hackberry	42.4
Shingle Oak	28.3
Osage Orange	20.0
Slippery Elm	6.9
Pin Oak	2.5

[1] Scientific names in Appendix A.

Mammals

Number of species which may occur: 17

Rare or endangered species which may occur: None

Species commonly observed or associated: Shorttail shrew, raccoon, woodchuck, white-tailed deer, white-footed mouse, eastern cottontail, red fox, gray fox.

The blend of streams, croplands, brush and forest in this land-use type provided excellent habitat for several species of mammals. Observations were made of 11 species and/or their sign (Table 4). Small mammal trapping yielded one deer mouse and six white-footed mice for a trap success of 11.7 animals/100 trap-nights, the highest in any habitat.

Birds

Number of species which may occur: 65

Rare or endangered species which may occur: Cooper's hawk, sharp-shinned hawk, Bewick's wren, loggerhead shrike.

Species commonly observed or associated: Bobwhite, catbird, white-eyed vireo, yellowthroat, red-winged blackbird, cardinal, indigo bunting, meadowlark, sparrows, American robin, mourning dove, mockingbird, brown thrasher.

Hedgerows provided excellent cover for nesting birds while adjacent croplands and streams provided feeding areas for insectivorous and granivorous species. Twenty-seven species were observed, making this area second only to forests in number of species present. However, more individuals of a given species were observed in hedgerows and edges than in forests (Table 5).

Amphibians and Reptiles

Number of species which may occur: 13

Rare or endangered species which may occur: None

Species commonly observed or associated: Eastern garter snake, small-mouthed salamander, eastern hognose snake, rough green snake.

Most of the edges and hedgerows were on well-drained soil and provided poor habitat for anurans. Frogs and other amphibians use edges adjacent to streams while snakes and lizards might be found in upland edges with further study. However, only eastern garter snakes were observed (Table 6).

Creeks

The JNA contained 3.8 miles of Galum Creek and 8.0 miles of tributaries. The creeks which were unusually high due to heavy spring rains, exhibited steep, muddy banks, scoured clean of vegetation, and silty bottoms. Except where they entered the JNA, they were slow-moving and turbid.

Vegetation

Vegetation bordering creeks was discussed under lowland-riparian forest habitat; rarely did vegetation occur at water edges due to the steep banks and fluctuating water level. No submergent or emergent vegetation was found, perhaps as a result of unstable water levels, heavy silt load and time of this study.

Invertebrates

Bottom sampling revealed a low diversity of benthic invertebrates in Galum Creek and tributaries (Table 14). The silty substrate provided habitat for mud-burrowing species such as crayfishes, chironomids and, occasionally, burrowing mayflies. The silty bottom and muddy banks provided for a low diversity of littoral zone species. Stonefly larvae, indicators of good water quality, were found in the upper parts of Galum Creek; but, this may reflect a temporary situation due to the high water level.

Table 14. Invertebrates collected during aquatic sampling of the JNA, May 1979.

Taxon	Sampling Locations[1,2]											
	C1	C2	C3	T1	T2	T3	T4	P1	P2	P3	P4	P5
Phylum Annelida												
Class Oligochaeta	X	X	X	X	X	X	X	X	X	A	X	X
Class Hirudinea										X		
Phylum Mollusca												
Class Gastropoda												
Order Pulmonata												
Family Physidae												
Physa spp.	X	A	X	A	X	A	A	X	X	X	X	X
Family Planorbidae												
Gyraulus spp.											X	
Family Lymnaeidae												
Lymnaea spp.											X	
Class Pelecypoda												
Family Sphaeriidae												
Sphaerium spp.	X	X	A				A				X	
Phylum Arthropoda												
Class Crustacea												
Order Isopoda							X	X	X			X
Family Asellidae												
Asellus spp.	X	A	X	X	X	X				X	X	
Lirceus spp.		X										
Order Amphipoda	X	X	X	X	X	X	X	X	X	X		X
Family Talitridae												

Table 14. Continued.

Taxon	Sampling Locations											
	C1	C2	C3	T1	T2	T3	T4	P1	P2	P3	P4	P5
Hyalella azteca											X	
Family Gammaridae												
Gammarus spp.		X					X					
Order Decapoda												
Family Astacidae	X	A	A	X	X	X	X	X	X	X	X	X
Class Insecta												
Order Collembola												
Family Poduridae												
Podura aquatica	X	X	X	X							X	
Family Isotomidae		X										
Order Plecoptera												
Family Perlidae												
Perlesta placida		A	A									
Order Ephemeroptera												
Family Heptageniidae												
Stenonema spp.			X									
Family Caenidae												
Caenis spp.	X	X	X	X			X				X	
Family Ephemeridae												
Hexagenia bilineata	X	X		A			X					
Family Baetidae												
Pseudocloeon spp.			X									

Table 14. Continued.

Taxon	Sampling Locations											
	C1	C2	C3	T1	T2	T3	T4	P1	P2	P3	P4	P5
Ameletus spp.												
Order Odonata												
Suborder Anisoptera												
Family Aeschnidae												
Aeschna spp.	X											
Family Libellulidae												
Libellula spp.	X						X					
Suborder Zygoptera												
Family Coenagrionidae												
Argia spp.						X						
Family Lestidae												
Lestes spp.								X			X	
Order Hemiptera												
Family Mesoveliidae												
Mesovelia mulsanti										X	X	
Family Gerridae												
Gerris spp.	X	X	X	X	X	X	X	X	X	X	X	X
Family Notonectidae												
Family Pleidae												
Plea striola										X	X	
Family Coriidae		X					X	X				
Order Megaloptera												
Family Corydalidae												

Table 14. Continued.

Taxon	Sampling Locations											
	C1	C2	C3	T1	T2	T3	T4	P1	P2	P3	P4	P5
Chavliodes spp.				X								
Family Sialidae												
Order Trichoptera												
Family Hydropsychidae												
Cheumatopsyche spp.			X			X						
Order Coleoptera												
Family Haliplidae												
Peltodytes spp.	X	X					X	X	X		X	X
Family Dytisicidae												
Hydrovatus spp.	X						X					
Hydroporus spp.							X					
Laccophilus spp.										X		
Cybister spp.										X		
Dytiscus spp.										X		
Hydaticus spp.								X				
Family Gyrinidae												
Gyrinus spp.							X					
Dineutes spp.			X					X				
Family Hydrophilidae												
Tropisternus spp.			X			X		X		X	X	
Tropisternus lateralis									X			
Berosus spp.						X			X		X	
Enochrus spp.										X		

Table 14. Continued.

Taxon	Sampling Locations C1	C2	C3	T1	T2	T3	T4	P1	P2	P3	P4	P5
Family Elmidae		X	X									
Order Diptera												
Family Tipulidae		X	X			X	X					
Family Culicidae		X			X							
Family Simuliidae			X									
Family Tendipedidae	X	A	X	X	X	A	X	X	X	X	X	X
Family Ceratopogonidae		X			X	X	X			X	X	X
Family Ephydridae					A							

[1] See Figure 1 for sampling locations.

[2] X - indicates present, A - indicates abundant in sample.

Fish

Number of species which may occur: 28

Rare or endangered species which may occur: None

Species commonly observed or associated: Golden shiner, bluntnose minnow, blackstripe topminnow, largemouth bass, green sunfish, bluegill.

Thirteen species of fish found in the creek and tributaries (Table 15) were characteristic of low-gradient, muddy-bottomed streams. The greatest variety of fish was found from upper Galum Creek. Although silty, this location was less turbid and had some shallow riffles and pools. These locations may become unsuitable for fish later in the year when creeks cease regular flow.

Other Vertebrates

Tracks of muskrats were commonly found on creek banks; and, beaver signs consisted only of old cuttings adjacent to Galum Creek. Birds that may utilize streams include wood ducks and belted kingfishers; neither was observed. Reptiles present included red-eared sliders, midland painted turtles, common snapping turtles, midland watersnakes and red-bellied watersnakes. Amphibians are more likely to use pools especially at the western ends of creeks and tributaries, and include cricket frogs, leopard frogs and bullfrogs.

Ponds

Five of ten ponds were sampled, two in woods (P1 and P3), two in cropland (P2 and P4) and one in woods-cropland edge (P5).

Vegetation

Vegetation surrounding ponds generally consisted of fescue grass, sedges, rushes, black willows and cottonwoods (APPENDIX A). Emergent

Table 15. Fish found during aquatic sampling of the JNA, May 1979.

	Sampling Locations[2]											
Species[1]	C1[3]	C2	C3	T1	T2	T3	T4	P1	P2	P3	P4	P5
Golden shiner		X	X	X	X	X			X		X	X
Creek chub			X									
Redfin shiner			X									
Bluntnose minnow		X	X									
Flathead minnow			X									
Creek chubsucker						X					X	
Black bullhead	X					X		X				
Pirate perch		X	X									
Blackstripe topminnow		X	X	X	X	X	X					
Largemouth bass	X										X	
Green sunfish	X	X	X	X	X	X		X	X		X	X
Bluegill	X	X	X			X	X				X	X
Longear sunfish											X	
White crappie											X	
Slough darter			X									

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[1] Scientific names in Appendix B.

[2] See Fig. 1 for sampling locations.

[3] Result of creel census; creek was too deep to seine at this location.

vegetation, such as cattails, common arrowleaf and water plantain was present. Submergent vegetation was found only in two ponds: Pond #3 (P3), in woods, was covered with duckweed while Pond #4 (P4) contained coontail and pondweed.

Invertebrates

A greater variety of littoral zone invertebrates, compared to creek habitat, was found due to the presence of aquatic vegetation. Pond bottoms, similar to the creeks, were silty mud with some accumulation of organic material; crayfishes and chironomids were commonly found during benthic sampling (Table 14).

Fish

Number of species which may occur: 14

Rare or endangered species which may occur: None

Species commonly observed or associated: Golden shiner, black bullhead, largemouth bass, green sunfish, bluegill.

Fishes were found in all ponds except P3; most were probably the result of stockings. Pond #4 (P4) was originally much larger, but the dam had been partially broken, lowering the water level. This pond contained the greatest variety of fish. Pond #2 (P2) contained very large green sunfish while numerous small bass were taken in Pond #5 (P5) (Table 15).

Other Vertebrates

Tracks and/or burrows of muskrats were recorded on all ponds. Green herons and mallards were observed and other waterfowl probably utilize the ponds during migration. Midland painted turtles, and red-eared sliders were observed and water snakes and snapping turtles would be expected. Leopard, chorus, cricket and bullfrogs were recorded while tadpoles and tiger salamander larvae were often netted.

DISCUSSION

Ecological Importance of the Jamestown North Area

The JNA blends cropland, forests, old fields, hedgerows, riparian habitat, permanent ponds and anthropogenic lands. This blend provides habitat for numerous mammals, birds, reptiles and amphibians. A high degree of interspersion assures that most animals can include required habitats within their home range.

Nearly 200 species of plants were identified during the 3-week field study. This number represents about half of what might be present throughout a year. The successional status of the flora ranged from pioneer or invader species such as wild onion and ragweed in cropland to mature oaks and hickories. Vegetative structure varied from very sparse open fields to dense canopy, subcanopy and ground cover in upland forests. In most land-use types one to three species clearly dominated but numerous additional species were also found. This dominance arrangement is typical of many temperate habitats.

Seventeen of 32 potential fish species were found in the JNA; all were characteristic of muddy-bottomed, low-gradient creeks. Although some species may have been missed due to collection techniques, the species found accurately represent those expected for the habitats available.

Only 6 of 15 potential amphibian species were identified in the JNA. Although much of the area was composed of well-drained upland sites unsuited for frogs, low-lying areas, ponds and streams should provide at least ephemeral breeding habitat and over-wintering areas. Many species of salamanders are secretive and/or nocturnal and visible

only with systematic searches and some anuran species are cryptic or are obvious only during rather restricted breeding seasons. Thus additional amphibians, especially spotted salamanders, small-mouthed salamanders, spring peepers, gray treefrogs, bullfrogs and wood frogs probably inhabit the area. No known endangered or threatened amphibian was likely to inhabit the JNA.

Ten of 30 potential reptile species were found in the study site; these represented 5 of 7 possible families. Colubirds, the least represented family, are often secretive and additional surveys might reveal rough green snakes, black rat snakes, red milk snakes and midland water snakes. The combination of standing water, moist old fields and cropland and upland sites should favor a greater variety of reptiles and amphibians than observed. Only the endangered eastern ribbon snake potentially inhabits the area.

Birds are very mobile and many migrants may use the area only in spring and autumn. Most of the 66 species found were potential breeders. Swainson's thrush, Tennessee warbler, Wilson's warbler, and rose-breasted grosbeaks were obvious migrants. Turkey vultures, red-tailed hawks and loggerhead shrikes probably used the area for feeding but did not appear to breed there. Potentially, 184 species of birds could use the JNA during some part of the year; 104 of these breed in southern Illinois. Endangered or threatened species which could use the area include Cooper's hawks, peregrine falcons, upland plovers, Wilson's phalarope, barn owls, short-eared owls, brown creepers, Bewick's wrens, veerys, loggerhead shrikes, Brewer's blackbirds, Henslow's sparrows and Bachman's sparrows. However, only one loggerhead shrike was observed on the area.

Nineteen of a possible 40 mammalian species were recorded. However, bats were not sampled and uncommon small mammals (e.g. least shrew, pine vole, meadow jumping mouse) had a low likelihood of being trapped. Other probable species included little brown bats, red bats, big brown bats and eastern pipistrels. Gray bats and Indiana bats are endangered species which may utilize the riparian habitats.

In summary, the diversity and interspersion within the JNA provides habitat for numerous vertebrate species. The area is typical of many farmland areas in southwestern Illinois where moderate agriculture is mixed with woodlots and riparian habitats. The JNA does not contain areas defined as critical habitat for endangered or threatened species.

Recreational Assets of the Jamestown North Area

Major recreational potential on the JNA includes fishing, small and large game hunting, trapping, wild berry picking, bird watching and wildlife photography. Limited potential exists for hiking, picnicking, camping and swimming.

Four of the ponds surveyed had fishes of adequate size for angling including white crappie, largemouth bass, green sunfish and bluegill. A few fishermen along the lower portion of Galum Creek had catches of largemouth bass, bluegill, green sunfish and catfish.

Game animals on the JNA included white-tailed deer, gray and fox squirrels, raccoons, opossums, cottontails, mourning doves and bobwhite quail. Two deer stands were observed along major trails and two waterfowl blinds were located on the large pond in the southeast part of the area. Limited hunting for teal, mallards and wood ducks might be possible within the JNA. Bobwhite quail and mourning doves were numerous and could attract hunters to the area.

Scattered berry bushes offered limited picking during early summer; however, there was no evidence of harvesting. No facilities for hiking, picnicking, camping or swimming were available. Sparse human populations in the area, lack of recreational facilities and proximity of Pyramid State Park, W. E. Mullins Recreational Area (owned by Southwestern Illinois Coal Co.) and city parks minimize the value of the JNA as a recreational area.

Economically or Otherwise Valuable Plant Species

Although no endangered or threatened plant species were found, the short term of this study prevented a complete inventory through even one growing season. The proposed Illinois list of endangered or threatened species includes over 360 species (Klimstra personal communication). Some of these may occur within the JNA.

The flora with the greatest commercial value were marketable hardwood species used for lumber and construction of wood products. The most commercially valuable species in the JNA included white oak, red oak, black oak, ash and black cherry (Fuller and Nuuttila 1955). Based on transect data, densities of these species were approximately 22, 3, 3, 17 and 6 trees/forest-acre, assuming a ratio of 2:1 for lowland and upland forests. Higher densities for the oaks and ash occurred in upland forests and for black cherry in lowland woods. Other marketable species included sycamore, hickories, river birch, pin oak, slippery elm, maples and sour gum (Fuller and Nuuttila 1955). These are used to produce a variety of wood products including fence posts, furniture and tools. Of these, only the hickories and maples were sufficiently dense for selective harvesting. The remaining species may return a profit through clear cut operations.

Economically or Otherwise Valuable Animal Species

Although several endangered or threatened species could potentially occur on the JNA, only one loggerhead shrike was found. The area does not appear to provide critical habitat for endangered species. The most valuable wildlife species, therefore, were game animals and fishes. White-tailed deer, cottontail rabbits, bobwhite quail, mourning doves, largemouth bass and sunfish were sufficiently numerous to attract sportsmen. Limited potential also exists for harvesting waterfowl, coyotes, raccoons, opossums, muskrats, mink, gray and red foxes. Present laws prohibit marketing of game animals and only the pelts of raccoons, muskrats, mink, coyotes and red foxes are commercially valuable.

Implications of Mining the JNA

Surface mining of the JNA will initially entail complete removal of vegetation with resultant loss of habitat and low-mobility wildlife. Diversion of Galum Creek and drainage of ponds will eliminate aquatic habitats and accompanying flora and fauna.

A well-planned program of reclamation can contribute to re-creation of habitats, to diversity in land use and to soil quality. Because of the extensive acreage of non-prime farmland, opportunities to provide quality habitats for wild animals are excellent; these should be aggressively addressed in post-mining land use. Obviously, time for reclaimed lands and waters to "mature" will determine how soon quality habitats become a reality. Single purpose land use must be avoided.

SUMMARY

Major land-use types in the Jamestown North Area (JNA), Perry County, Illinois included croplands, lowland and upland forests, pastures, old fields, hedgerows, farmsteads, ponds and roads. A 3.8 mile section of Galum Creek and 8.0 miles of connecting tributaries flowed through the area.

Flora composition included 190 plant species found during a 3-week study. Vegetation ranged from early invader species such as wild onion and common ragweed to mature oaks, maples and hickories. Habitat structure varied from exposed cropland to well-developed strata in upland forests. No endangered species of plants were found.

Vertebrates seen on the JNA included 17 species of fishes, 6 amphibians, 10 reptiles, 66 birds and 19 mammals; several others probably occur. Most of these animals probably bred in the area. Although several endangered or threatened species including migrants might use the area, only a loggerhead shrike was recorded on the edge of the study site.

Recreational assets of the area were limited. Some hunting for waterfowl, rabbits, deer, quail and doves as well as fishing for bass and sunfish were possible. There were no facilities for picnicking, hiking or camping.

Economically valuable plants included three species of oak, hickories and black cherry. Selective cutting would only be profitable for oaks and hickories but clear cutting would make other species available. Game animals and furbearers could provide some monetary assets.

Perhaps the greatest ecological value of the JNA is its diversity and interspersion of land-use types. Although surface mining would initially destroy this diversity, proper reclamation and careful follow-up studies could help restore it.

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APPENDICES

APPENDIX A

PLANTS FOUND WITHIN THE JAMESTOWN NORTH AREA, MAY 1979

Taxon	Habitat[1]
Ophidglossaceage	
Rattlesnake fern (*Botrychium virginianum*)	uw
Cupressaceae	
Red cedar (*Juniperus virginiana*)	of
Typhaceae	
Narrow-leafed cat-tail (*Typha augustifolia*)	p
Potamogetonaceae	
Pondweed (*Potamogeton* spp.)	p
Altismaceae	
Common arrowleaf (*Sagittaria latifolia*)	p
Water plaintain (*Alisma plantago-aquatica*)	p
Poaceae	
Downy chess (*Bromus tectorum*)	c, h
Meadow fescue (*Festuca pratensis*)	c, of, h, p
Bluegrass (*Poa* spp.)	c, of, h
Orchard grass (*Dactylis glomerata*)	of, h
Red top (*Agrostis alba*)	c, of, h

Stout wood reed (*Cinna arundinacea*)	c, h
Common foxtail (*Alopecurus carolinianus*)	c
Timothy (*Phleum pratense*)	c, of
Bottlebrush grass (*Elymus hystrix*)	lw
Virginia wild rye (*E. virginicus*)	c, of, h
Wheat (*Triticum aestivum*)	c
Fowl manna grass (*Glyceria striata*)	lw
Broad-leafed panic grass (*Panicum clandestinum*)	h
Barnyard grass (*Echinochloa crus-galli*)	c
Broom sedge (*Andropogon virginicus*)	of
Purple top (*Tridens flavus*)	of, h
Giant cane (*Arundinaria gigantea*)	lw
Cyperaceae	
Sedges	
(*Carex grayi*)	lw, of
(*C. cristatella*)	of
(*C. squarrosa*)	of
(*Carex* spp.)	lw, of
Araceae	
Green dragon (*Arisaema dracontium*)	uw
Lemnaceae	
Duckweed (*Lemna* spp.)	p

Commelinaceae	
Spiderwort	
(*Tradescantia ohiensis*)	h
(*T. virginiana*)	uw, h
Juncaceae	
Rush	
(*Juncus spp.*)	p
Liliaceae	
Star-of-bethlehem	
(*Ornithogalum umbellatum*)	c, of
White dog-tooth violet	
(*Erythronium albidum*)	uw
Solomon's seal	
(*Polygonatum commutatum*)	uw, h
False solomon's seal	
(*Smilacina racemosa*)	uw,
Asparagus	
(*Asparagus officinalis*)	h
Wild onion	
(*Allium canadense*)	c, lw, of
Field garlic	
(*A. vineale*)	c
Red trillium	
(*Trillium recurvatum*)	uw
Daffodil	
(*Narcissus pseudo-narcissus*)	h
American agave	
(*Polianthes virginica*)	uw
Smilacaceae	
Catbrier	
(*Smilax rotundiflora*)	uw, of, h
Dioscoreaceae	
Wild yam	
(*Dioscorea villosa*)	uw

Iridaceae	
Wild blue iris (*Iris shrevei*)	of
Blue-eyed grass (*Sisyrinchium albidum*)	of
Salicaceae	
Black willow (*Salix nigra*)	lw, p
Cottonwood (*Populus deltoides*)	p
Juglandaceae	
Black walnut (*Juglans nigra*)	uw
Sweet pignut hickory (*Carya ovalis*)	uw
Pignut hickory (*C. glabra*)	uw
Shagbark hickory (*C. ovata*)	uw
Betulaceae	
River birch (*Betula nigra*)	lw
Fagaceae	
Shingle oak (*Quercus imbricaria*)	of, h
Black oak (*Q. velutina*)	uw
Red oak (*Q. rubra*)	uw, of
Pin oak (*Q. palustris*)	uw, lw, h
White oak (*Q. alba*)	uw, h
Post oak (*Q. stellata*)	of, h

Ulmaceae	
Slippery elm (*Ulmus rubra*)	uw, lw, of, h
Hackberry (*Celtis occidentalis*)	lw, h
Moraceae	
Red mulberry (*Morus rubra*)	uw
Osage orange (*Maclura pomifera*)	h
Urticaceae	
Stinging nettle (*Urtica dioica*)	lw
Aristolochiaceae	
Wild ginger (*Asarum canadense*)	lw
Polygonaceae	
Curly dock (*Rumex crispus*)	c, of, h
Pale dock (*R. altissimus*)	c, h
Sour dock (*R. acetosella*)	c
Smartweed (*Polygonum* spp.)	c, lw, h
Chenopodiaceae	
Lamb's quarters (*Chenopodium album*)	c
Amaranthaceae	
Pigweed (*Amarantus* spp.)	c
Phytolaccaoceae	
Pokeweed (*Phytolacca americana*)	uw, h

Portulacaceae	
Spring beauty (*Claytonia virginica*)	uw
Ceratophyllaceae	
Coontail (*Ceratophyllum demersum*)	p
Nelumbonaceae	
American louts (*Melumbo lutea*)	p
Ranunculaceae	
Bristly buttercup (*Ranunculus hispidus*)	lw
Dwarf larkspur (*Delphinium tricorne*)	lw
Columbine (*Aquilegia canadensis*)	uw
Mayapple (*Podophyllum peltatum*)	uw, of
Magnoliaceae	
Tulip tree (*Liriodendron tulipifera*)	uw
Annonaceae	
Pawpaw (*Asimina triloba*)	lw
Lauraceae	
Sassafras (*Sassafras albidum*)	uw
Spice bush (*Lindera benzoin*)	lw
Papaveraceae	
Pale corydalis (*Corydalis flavula*)	lw

Cruciferae	
Toothwort (*Dentaria laciniata*)	lw
Shepherd's-purse (*Capsella bursa-pastoris*)	c
Yellow rocket (*Barbarea vulgaris*)	c
Common peppergrass (*Lepidium virginicum*)	c
Yellow cress (*Rorippa* spp.)	
Hamamelidaceae	
Sweet gum (*Liquidambar styraciflua*)	uw
Platanaceae	
Sycamore (*Platanus occidentalis*)	lw, p
Rosaceae	
Wild black cherry (*Prunus serotina*)	lw
Hawthorn (*Crataegus* spp.)	of
Dewberry (*Rubus flagellaris*)	c, of, h
Blackberry (*R. pensylvanicus*)	c, of, h
Multiflora rose (*Rosa multiflora*)	of, h
Prairie rose (*R. setigera*)	h
Pasture rose (*R. carolina*)	h
Common cinquefoil (*Potentilla simplex*)	uw, of

Sulfur cinquefoil (*P. recta*)	of
Wild strawberry (*Frageria virginiana*)	h
White avens (*Geum canadense*)	lw, of
Swamp agrimony (*Agrimonia parviflora*)	lw, of
Leguminosae	
Redbud (*Cercis canadensis*)	uw
Honey locust (*Gleditsia triacanthos*)	lw, of, h
Black locust (*Robinia pseudoacacia*)	h
White sweet clover (*Melilotus alba*)	of
Yellow sweet clover (*M. officinalis*)	c, of
Red clover (*Trifolium pratense*)	c, of, h
White clover (*T. repens*)	c, of, h
Tick trefoil (*Desmodium* spp.)	of
Oxalidaceae	
Purple oxalis (*Oxalis violacea*)	uw
Yellow wood sorrel (*O. stricta*)	uw, of, h
Geraniaceae	
Wild geranium (*Geranium maculatum*)	uw

Euphorbiaceae	
Flowering spurge (*Euphorbia corollata*)	c
Leafy spurge (*E. esula*)	c
Callitrichaceae	
Terrestrial starwort (*Callitriche terrestris*)	c
Anacardiaceae	
Poison ivy (*Toxicodendron radicans*)	lw, h
Dwarf sumac (*Rhus copallina*)	of
Staghorn sumac (*R. typhina*)	of, h
Staphyleaceae	
Bladdernut (*Staphylea trifolia*)	lw
Aceraceae	
Box elder (*Acer negundo*)	lw
Sugar maple (*A. saccharum*)	uw, lw
Silver maple (*A. saccharinum*)	lw
Red maple (*A. rubrum*)	uw
Balsaminaceae	
Touch-me-not (*Impatiens* spp.)	lw
Vitaceae	
Virginia creeper (*Parthenocissus quinquefolia*)	uw, of, h

Grape (*Vitis* spp.)	uw, h
Violaceae	
Common blue violet (*Viola pratincola*)	lw
Woolly blue violet (*V. sororia*)	uw, lw
Cream violet (*V. striata*)	lw
(*Violet* spp.)	lw, of
Nyssaceae	
Sour gum (*Nyssa sylvatica*)	lw
Umbelliferae	
Meadow parsnip (*Thaspium trifoliatum*)	h
Common snakeroot (*Sanicula gregaria*)	uw
Queen-anne's-lace (*Daucus carota*)	of, h
Honewort (*Cryptotaenia canadensis*)	uw, lw
Water parsnip (*Sium suave*)	lw
Water hemlock (*Cicuta maculata*)	lw
Ebenaceae	
Persimmon (*Diospyros virginiana*)	uw, p
Oleaceae	
Green ash (*Fraxinus pennsylvanica*)	uw, lw, of, h, p

Apocynaceae	
Blue star (*Amsonia tabernaemontana*)	of, h
Indian hemp (*Apocynum cannabinum*)	of
Asclepiadaceae	
Common milkweed	
(*Asclepias syriaca*)	of, h
(*Asclepias* spp.)	of, h
Blue vine (*Cynanchum laevie*)	uw
Convolvulaceae	
Wild sweet potato vine (*Ipomoea pandurata*)	c
Polemoniaceae	
Blue phlox (*Phlox divariacata*)	lw
Jacob's-ladder (*Polemonium reptans*)	uw
Hydrophyllaceae	
Virginia waterleaf (*Hydrophyllum virginianum*)	lw
Boraginaceae	
Bluebells (*Mertensia virginica*)	lw
Corn gromwell (*Lithospermum arvense*)	c
Labiatae	
Common water horehound (*Lycopus americanus*)	lw
Bee balm (*Monarda clinopodia*)	uw
Pagoda plant (*Blephilia ciliata*)	h

Slender mountain mint (*Pycnanthemum tenuifolium*)	uw, lw, of, h
Henbit (*Lamium amplexicaule*)	c
Purple dead nettle (*L. purpuem*)	lw
Self-heal (*Prunella vulgaris*)	lw
Solanaceae	
Horse-nettle (*Solanum carolinense*)	c
Jimsonweed (*Dactura stramonium*)	of
Scrophulariaceae	
White speedwell (*Veronica peregrina*)	c
Foxglove beard-tongue (*Penstemon digitalis*)	uw
Pale beard-tongue (*P. pallidus*)	h
Blue-eyed mary (*Collinsia verna*)	lw
Woolly mullein (*Verbascum thapsus*)	of, h
Bignoniaceae	
Trumpet creeper (*Campsis radicans*)	lw, h, p
Plantaginaceae	
Small plantain (*Plantago pusilla*)	c
Buckhorn (*P. lanceolata*)	c
Rugel's plantain (*P. rugeloii*)	c

Rubiaceae	
Buttonbush (*Cephalanthus occidentalis*)	p
Wild licorice (*Galium circaezans*)	lw
Goosegrass (*G. aparine*)	uw, lw, h
Sweet-scented bedstraw (*G. triflorum*)	uw, lw
Shining bedstraw (*G. concinnum*)	lw
Caprifoliaceae	
Japanese honeysuckle (*Lonicera japonica*)	uw, lw, of, h
Campanulaceae	
Venus' looking glass (*Specularia perfoliata*)	h
Compositae	
Cup-plant (*Silphium perfoliatum*)	of, h
Giant ragweed (*Ambrosia trifida*)	c, of, h
Common ragweed (*A. artemisiifolia*)	c, of, h
Common cocklebur (*Xanthium strumarium*)	h
Beggar-ticks (*Bidens* spp.)	of, h
Goldenrod (*Solidago* spp.)	lw, of, h
Daisy fleabane (*Erigeron strigosus*)	c, of, h
Milfoil (*Achillea millefolium*)	c, of, h

Ox-eye daisy (*Chrysanthemum leucanthemum*)	of
White snakeroot (*Eupatorium rugosum*)	uw
Common burdock (*Arctium minus*)	of
Common dandelion (*Taraxacum officinale*)	c, of, h
Prickly lettuce (*Lactuca serriola*)	c, of, h

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[1] Habitats: c = cropland, uw = upland woods, lw = lowland-riparian woods, of = oldfield-pasture, h = hedgerow-edge, p = pond.

APPENDIX B

POTENTIAL FISHES ON THE JAMESTOWN NORTH AREA[1]

- CYPRINIFORMES
  - Cyprinidae
    - Carp (*Cyprinus carpio*); soft bottomed pools of rivers, lakes
    - Golden shiner (*Notemigonus crysoleucas*); well-vegetated ponds, lakes, stream pools
    - Creek chub (*Semotilus atromaculatus*); creeks
    - Ribbon shiner (*Notropis fumeus*); slow moving creeks
    - Red shiner (*N. lutrensis*); creeks
    - Redfin shiner (*N. umbratilis*); creeks
    - Bluntnose minnow (*Pimephales notatus*); creeks, small rivers
    - Flathead minnow (*P. promelas*); sluggish creeks, ditches
  - Catostomidae
    - White sucker (*Catostomus commersoni*); creeks, small rivers
    - Spotted sucker (*Minytrema melanops*); creeks, small rivers
    - Creek chubsucker (*Erimyzon oblongus*); slow creeks
  - Ictaluridae
    - Black bullhead (*Ictalurus melas*); lakes, ponds, pools
    - Yellow bullhead (*I. natalis*); streams, ponds
    - Channel catfish (*I. punctatus*); stocked ponds
    - Tadpole madtom (*Noturus gyrinus*); lakes, muck bottomed creeks
- APHREDODERIFORMES
  - Aphredoderidae
    - Pirate perch (*Aphredoderus sayanus*); ponds, ditches, creeks
- CYPRINIDONTIFORMES
  - Cyprinidontidae
    - Blackstripe topminnow (*Fundulus notatus*); quiet creeks, rivers, lakes
    - Blackspotted topminnow (*F. olivaceus*); streams
  - Poeciliidae
    - Mosquitofish (*Gambusia affinis*); ditches, ponds
- PERCIFORMES
  - Centrarchidae
    - Largemouth bass (*Micropterus salmoides*); ponds, lakes,rivers
    - Green sunfish (*Lepomis cyanellus*); small ponds, creeks
    - Warmouth (*L. gulosus*); ponds, lakes,streams
    - Orange-spotted sunfish (*L. humilis*); ponds, lakes, streams
    - Bluegill (*L. macrochirus*); lakes, ponds, streams
    - Longear sunfish (*L. megalotis*); creeks, small rivers
    - Redear sunfish (*L. microlophus*); lakes, ponds, streams
    - White crappie (*Pomoxis annularis*); lakes, rivers
    - Black crappie (*P. nigromaculatus*); lakes, rivers
    - Flier (*Centrarchus macropterus*); lakes, sloughs, slow streams

Percidae
  Bluntnose darter (*Etheostoma chlorosomum*); shallow lakes, creeks
  Slough darter (*E. gracile*); shallow lakes, ponds, creeks
  Orangethroat darter (*E. spectabile*); small creeks

[1] Species list and habitats from Smith (1979).

APPENDIX C

POTENTIAL AMPHIBIAN AND REPTILIAN SPECIES ON THE JAMESTOWN NORTH AREA[1]

- AMPHIBIA
  - CAUDATA
    - Ambystomatidae
      - Spotted salamander (*Ambystoma maculatum*); floodplain woodlands
      - Marbled salamander (*A. opacum*); moist sandy areas to dry hillsides
      - Small-mouthed salamander (*A. texanum*); woods, prairie, pasture, cropland
      - Eastern tiger salamander (*A. tigrinum tigrinum*); wide spread
    - Salamandridae
      - Central newt (*Notophthlamus viridescens louisianensis*); swales, woodland ponds, ditches, river bottoms
    - Plethodontidae
      - Slimy salamander (*Plethodon glutinosus glutinosis*); wooded hillsides
  - ANURA
    - Bufonidae
      - Dwarf American toad (*Bufo americanus charlesmithi*); forested areas
      - Fowler's toad (*B. woodhousei fowleri*); widespread
    - Hylidae
      - Blanchard's cricket frog (*Acris crepitans blanchardi*); wet areas
      - Chorus frog (*Pseudacris triseriata*); forested areas
      - Spring peeper (*Hyla crucifer*); mesic forests, woodland ponds
      - Gray treefrog (*H. versicolor*); forested areas
    - Ranidae
      - Bullfrog (*Rana catesbeiana*); permanent bodies of water
      - Green frog (*R. clamitans melanota*); clear streams
      - Leopard frog (*R. pipiens sphenocephala*); streams, ponds, lakes

- REPTILIA
  - TESTUDINES
    - Chelydridae
      - Common snapping turtle (*Chelydra serpentina serpetina*); any permanent body of fresh water
    - Kinosternidae
      - Stinkpot turtle (*Sternothaerus odoratus*); shallow, clear-water lakes, ponds and rivers
      - Eastern mud turtle (*Kinosternon subrubrum*); shallow water

Emydidae
Eastern box turtle (*Terrapene carolina carolina*); terrestrial; wooded areas
Midland painted turtle (*Chrysemys picta marginata*); slow running waters
Red-eared turtle (*Pseudemys scripta elegans*); quiet backwaters, ponds
Trionychidae
Eastern spiny softshell (*Trionyx spiniferus spiniferus*); rivers, lakes

SQUAMATA
Iguanidae
Northern fence lizard (*Sceloporus undulatus hyacinthinus*); open dry wooded areas
Anguidae
Slender glass lizard (*Ophisaurus attenuatus attenuatus*); dry grasslands, dry woods
Scincidae
Ground skink (*Scincella laterale*); woodland floor
Five-lined skink (*Eumeces fasciatus*); buildings, cutover woodlots
Broad-headed skink (*E. laticeps*); woodlands, arboreal
Colubridae
Worm snake (*Carphophis amoenus*); fossorial, forests, rock outcrops
Mud snake (*Farancia abacura*); shallow ponds and sloughs
Eastern hognose snake (*Heterodon platyrhinos*); flood plains, forest edges
Rough green snake (*Opheodrys aestivus*); forest edges
Racer (*Coluber constrictor*); forest edge
Black rat snake (*Elaphe obsoleta*); wooded bluffs
Prairie kingsnake (*Lampropeltis calligaster calligaster*); old fields
Speckled kingsnake (*L. getulus holbrooki*); wooded, hilly terrain
Red milk snake (*L. triangulum syspila*); wooded and grassy hillsides
[2]Eastern ribbon snake (*Thamnophis sauritus proximus*); marsh edges and upland woods
Eastern garter snake (*T. sirtalis sirtalis*); forest edges
Western earth snake (*Virginia valeriae elegans*); wooded hillsides
Midland brown snake (*Storeria dekayi wrightorum*); widespread
Northern red-bellied snake (*S. occipitomaculata*); wooded areas
Yellow-bellied water snake (*Natrix erythrogaster*); ponds, lakes, swamps
Diamond-backed water snake (*Natrix rhombifera*); lakes, sloughs, ponds
Midland water snake (*N. sipedon pleuralis*); swift running streams
Crotalidae
Timber rattlesnake (*Crotalus horridus*); forested bluffs, rock outcrops

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[1] Adapted from Smith (1961) and Conant (1975).

[2] Species is listed on Federal or Illinois lists of endangered fauna.

APPENDIX D

POTENTIAL AVIAN SPECIES IN JAMESTOWN NORTH AREA[1]

Taxon	Preferred[2] Habitat	Status[3]
ANSERIFORMES		
Anatidae		
Canada goose (*Branta canadensis*)	cr, p	mig.
Snow goose (*Anser caerulescens*)	cr, p	mig.
Mallard (*Anas platyrhynchos*)	r, p	sum. res.
Black duck (*Anas rubripes*)	r, p	mig.
Gadwall (*Anas strepera*)	r, p	mig.
Pintail (*Anas acuta*)	r, p	mig.
Green-winged teal (*Anas carolinensis*)	p	mig.
Blue-winged teal (*Anas discors*)	p	sum. res.
American widgeon (*Mareca americana*)	p	mig.
Shoveler (*Spatula clypeata*)	p	mig.
Wood duck (*Aix sponsa*)	p, fo	sum. res.
Ring-necked duck (*Aythya collaris*)	p	mig.
Canvasback (*Aythya valisineria*)	p	mig.
Lesser scaup (*Aythya affinis*)	p	mig.

Common goldeneye (*Bucephala clangula*)	p, r	mig.
Ruddy duck (*Oxyura jamaicensis*)	p, r	mig.
Hooded merganser (*Lophadytes cucullatus*)	p, r	sum. res.
Common merganser (*Mergus merganser*)	p, r	mig.
Red-breasted merganser (*Mergus serrator*)	p, r	mig.
FALCONIFORMES		
Cathartidae		
Turkey vulture (*Cathartes aura*)	of, pa, cr	sum. vis.
Black vulture (*Coragyps atratus*)	f, pa, cr	ca. vis.
Accipitridae		
Mississippi kite (*Ictinia misisippiensis*)	fo, of	sum. res.; en
Sharp-shinned hawk (*Accipiter striatus*)	fe, fo	mig.
Cooper's hawk (*Accipiter cooperii*)	fe, fo	ca. res.; en
Red-tailed hawk (*Buteo jamaicensis*)	fo, of, pa, cr	ca. res.
Red-shouldered hawk (*Buteo lineatus*)	cr, fo	ca. res.; en.
Broad-winged hawk (*Buteo platypterus*)	fo	sum. res.
Rough-legged hawk (*Buteo lagopus*)	of, pa, cr	wint. vis.
Golden eagle (*Aquila chrysaetos*)	of, gr	wint. vis.
Bald eagle (*Haliaetus leucocephalus*)	fo	wint. vis.; en.

Marsh hawk (*Circus cyaneus*)	gr, of	wint. vis.; en.
Falconidae		
Peregrine falcon (*Falco peregrinus*)	fo	wint. vis.; en.
Merlin (*Falco columbarius*)	of, gr, cr	wint. vis.
American kestrel (*Falco sparverius*)	of, gr, cr	ca. res.
GALLIFORMES		
Phasianidae		
Bobwhite (*Colinus virginianus*)	of, br, fe	ca. res.
CICONIIFORMES		
Ardeidae		
Green heron (*Butorides virescens*)	p, r	sum. res.
Cattle egret (*Bubulcus ibis*)	pa, cr	sum. res.
GRUIFORMES		
Rallidae		
American coot (*Fulica americana*)	p	ca. res.
CHARADRIIFORMES		
Charadriidae		
Killdeer (*Charadrius vociferus*)	pa, of, cr	ca. res.
Scolopacidae		
American woodcock (*Philohela minor*)	of, fo, br	ca. res.
Common snipe (*Capella gallinago*)	gr, r, p	wint. vis.

Upland plover (*Batramia longicauda*)	gr, p	sum. res.; en.
Spotted sandpiper (*Actitis macularia*)	r	sum. res.
Solitary sandpiper (*Tringa solitaria*)	r	mig.
Pectoral sandpiper (*Erolia melanotos*)	gr, pa	mig.
Phalaropidae		
Wilson's phalarope (*Steganopus tricolor*)	p	mig.; en.
Laridae		
Herring gull (*Larus argentatus*)	r, p	wint. vis.
Ring-billed gull (*Larus delawarensis*)	pa, cr, r	wint. vis.
Franklin's gull (*Larus pipixcan*)	cr, gr, p	mig.
COLUMBIFORMES		
Columbidae		
Rock dove (*Columba livia*)	p, cr, a	ca. res.
Mourning dove (*Zenaidura macroura*)	p, of, cr	ca. res.
CUCULIFORMES		
Cuculidae		
Yellow-billed cuckoo (*Coccyzus americanus*)	fo, fe, of, br	sum. res.
Black-billed cuckoo (*Coccyzus erythropthalamus*)	fo, fe	mig.
STRIGIFORMES		
Tytonidae		
Barn owl (*Tyto alba*)	of, a	ca. res.; en.

Strigidae		
Screech owl (*Otus asio*)	fo	ca. res.
Great-horned owl (*Bubo virginianus*)	fo	ca. res.
Short-eared owl (*Asio flammeus*)	gr, of cr	mig.; en.
CAPRIMULGIFORMES		
Caprimulgidae		
Whip-poor-will (*Caprimulgus vociferus*)	fo	sum. res.
Common nighthawk (*Chordeiles minor*)	cr, gr, of	sum. res.
APODIFORMES		
Apodidae		
Chimney swift (*Chaetura pelagica*)	a	sum. res.
Trochilidae		
Ruby-throated hummingbird (*Archilochus colubris*)	a, fo	sum. res.
CORACIIFORMES		
Alcedinidae		
Belted kingfisher (*Megaceryle alcyon*)	r	ca. res.
PICIFORMES		
Picidae		
Common flicker (*Colaptes auratus*)	fe, a	ca. res.
Pileated woodpecker (*Dryocopus pileatus*)	fo	ca. res.
Red-bellied woodpecker (*Centurus carolinensis*)	fo	ca. res.
Red-headed woodpecker (*Melanerpes erythrocephalus*)	fo	ca. res.

Yellow-bellied sapsucker (*Sphyrapicus varius*)	fo	wint. vis; th
Hairy woodpecker (*Dendrocopos villosus*)	fo	ca. res.
Downy woodpecker (*Dendrocopus pubescens*)	fo, fe	ca. res.
PASSERIFORMES		
Tyrannidae		
Eastern kingbird (*Tyrannus tyrannus*)	fe, of	sum. res.
Great-crested flycatcher (*Myiarchus crinitus*)	fo	sum. res.
Eastern phoebe (*Sayornis phoebe*)	fe, a	sum. res.
Yellow-bellied flycatcher (*Empidonax flaviventris*)	fo	mig.
Acadian flycatcher (*Empidonax virescens*)	fo	sum. res.
Traill's flycatcher (*Empidonax trailii*)	br	mig.
Least flycatcher (*Empidonax minimus*)	fe	sum. res.
Eastern wood peewee (*Contopus sordidulus*)	fo	sum. res.
Alaudidae		
Horned lark (*Eremophila alpestris*)	cr, gr	ca. res.
Hirundinidae		
Tree swallow (*Iridoprocne bicolor*)	r, p	sum. res.
Bank swallow (*Riparia riparia*)	r, p	mig.
Rough-winged swallow (*Stelgidopteryx ruficollis*)	r, p	sum. res.

Barn swallow (*Hirundo rustica*)	a, cr	sum. res.
Cliff swallow (*Petrochelidon pyrrhonota*)	a, cr, r	sum. res.
Corvidae		
Blue jay (*Cyanocitta cristata*)	fo, fe	ca. res.
Common crow (*Corvus brachyrhynchos*)	cr	ca. res.
Paridae		
Carolina chickadee (*Parus carolinensis*)	fo	ca. res.
Tufted titmouse (*Parus bicolor*)	fo	ca. res.
Sittidae		
White-breasted nuthatch (*Sitta carolinensis*)	fo	ca. res.
Certhiidae		
Brown creeper (*Certhia familiaris*)	fo	ca. res.; en.
Troglodytidae		
House wren (*Troglodytes aedon*)	fe, a	sum. res.
Winter wren (*Troglodytes troglodytes*)	fo, br	wint. vis.
Bewick's wren (*Thryomanes bewickii*)	br, fe	ca. res.; th.
Carolina wren (*Thryothurus ludovicianus*)	br, fe, fo	ca. res.
Short-billed marsh wren (*Cistothurus platensis*)	pa, gr	mig.
Mimidae		
Mockingbird (*Mimus polyglottos*)	fe, a	ca. res.
Catbird (*Dumetella carolinensis*)	fe, a	sum. res.

Brown thrasher (*Toxostoma rufum*)	fe, a	sum. res.
Turdidae		
American robin (*Turdus migratorius*)	fe, a	ca. res.
Wood thrush (*Hylocichla mustelina*)	fo	sum. res.
Hermit thrush (*Hylocichla guttata*)	fo	wint. vis.
Swainson's thrush (*Hylocichla ustulata*)	fo	mig.
Gray-cheeked thrush (*Hylocichla minima*)	fo	mig.
Veery (*Hylocichla fuscescens*)	fo	mig.; th.
Eastern bluebird (*Siala sialis*)	fe, a	ca. res.
Sylviidae		
Blue-gray gnatcatcher (*Polioptila caerulea*)	fo	sum. res.
Golden-crowned kinglet (*Regulus satrapa*)	fo	wint. vis
Ruby-crowned kinglet (*Regulus calendula*)	fo	wint. res.
Bombycillidae		
Cedar waxwing (*Bombycilla cedrorum*)	fe	ca. res.
Laniidae		
Loggerhead shrike (*Lanius ludovicianus*)	fe, pa	ca. res.; th.
Sturnidae		
Starling (*Sturnus vulgaris*)	fe, cr, a	ca. res.

Vireonidae		
White-eyed vireo (*Vireo griseus*)	fe, fo	sum. res.
Bell's vireo (*Vireo bellii*)	fe, br	sum. res.
Yellow-throated vireo (*Vireo flavifrons*)	fo, of	sum. res.
Solitary vireo (*Vireo solitarius*)	fo	mig.
Red-eyed vireo (*Vireo olivaceus*)	fo	sum. res.
Warbling vireo (*Vireo gilvus*)	fe	sum. res.
Parulidae		
Black and white warbler (*Mniotilta varia*)	r, fo	mig.
Prothonotary warbler (*Protonotaria citrea*)	r, fo	sum. res.
Worm-eating warbler (*Helmitheros vermivorus*)	fo	sum. res.
Golden-winged warbler (*Vermivora chrysoptera*)	fo, pa, fe	mig.
Blue-winged warbler (*Vermivora pinus*)	pa, fe	sum. res.
Tennessee warbler (*Vermivora peregrina*)	fe, fo	mig.
Orange-crowned warbler (*Vermivora celata*)	fe	mig.
Nashville warbler (*Vermivora ruficapilla*)	fo, fe	mig.
Parula warbler (*Parula americana*)	fo	sum. res.
Yellow warbler (*Dendroicha petechia*)	fe	sum. res.
Magnolia warbler (*Dendroica magnolia*)	br, fe	mig.

Cape may warbler (*Dendroica tigrina*)	fe	mig.
Black-throated blue warbler (*Dendroica caerulescens*)	fo	mig.
Yellow-rumped warbler (*Dendroica coronata*)	fo, fe	wint. res.
Black-throated green warbler (*Dendroica virens*)	fo	mig.
Cerulean warbler (*Dendroica cerulea*)	fo	sum. res.
Blackburnian warbler (*Dendroica fusca*)	fo	mig.
Yellow-throated warbler (*Dendroica dominica*)	fo	sum. res.
Chestnut-sided warbler (*Dendroica pensylvanica*)	fe	mig.
Bay-breasted warbler (*Dendroica castanea*)	fe, fo	mig.
Blackpoll warbler (*Dendroica striata*)	fe	mig.
Palm warbler (*Dendroica palmarum*)	fe	mig.
Ovenbird (*Seiurus aurocapillus*)	fo	mig.
Northern waterthrush (*Seiurus noveboracensis*)	fo, r	mig.
Louisiana waterthrush (*Seiurus motacilla*)	fo, r	sum. res.
Kentucky warbler (*Oporornis formosus*)	fo	sum. res.
Connecticut warbler (*Oporornis agilis*)	fo, fe	mig.
Mourning warbler (*Oporornis philadelphia*)	br, fe	mig.
Yellowthroat (*Geothlypis trichas*)	br, gr	sum. res.

Yellow-breasted chat (*Icteria virens*)	fe	sum. res.
Hooded warbler (*Wilsonia citrina*)	fo	sum. res.
Wilson's warbler (*Wilsonia pusilla*)	br, fe	mig.
Canada warbler (*Wilsonia canadensis*)	br	mig.
American redstart (*Setophaga ruticilla*)	fo	sum. res.
Ploceidae		
House sparrow (*Passer domesticus*)	a	ca. res.
Icteridae		
Bobolink (*Dolichonyx oryzivorus*)	pa, gr	mig.
Eastern meadowlark (*Sturnella magna*)	cr, pa, gr	ca. res.
Red-winged blackbird (*Agelaius phoeniceus*)	pa, cr	ca. res.
Orchard oriole (*Icterus spurius*)	fe	sum. res.
Baltimore oriole (*Icterus galbula*)	fe, a	sum. res.
Rusty blackbird (*Euphagus carolinus*)	fo, pa	wint. vis.
Brewer's blackbird (*Euphagus cyanocephalus*)	pa, gr	mig.; th.
Common grackle (*Quiscalus quiscala*)	cr, pa, a	ca. res.
Brown-headed cowbird (*Molothrus ater*)	cr, pa	ca. res.
Thraupidae		
Scarlet tanager (*Piranga olivacea*)	fo	sum. res.
Summer tanager (*Piranga rubra*)	fo	sum. res.

Fringillidae

Cardinal (*Cardinalis cardinalis*)	fe, a, of	ca. res.
Rose-breasted grosbeak (*Pheucticus ludovicianus*)	fo, fe, a	mig.
Blue grosbeak (*Guiraca caerula*)	fe	sum. res.
Indigo bunting (*Passerina cyanea*)	fe, of	sum. res.
Dickcissel (*Spiza americana*)	pa, cr, a	sum. res.
American goldfinch (*Spinus tristis*)	fe, a, cr	ca. res.
Rufous-sided towhee (*Pipilo erythropthalamus*)	fe, br, of	ca. res.
Savannah sparrow (*Passerculus sandwichensis*)	pa, gr, of	mig.
Grasshopper sparrow (*Ammodramus savannarum*)	of, pa	sum. res.
Henslow's sparrow (*Passerherbulus henslowii*)	of, gr	mig.; th.
Vesper sparrow (*Pooeretes gramineus*)	of, pa	mig.
Lark sparrow (*Chondestes grammacus*)	br, of, fe	sum. res.
Bachman's sparrow (*Aimophila aestivatis*)	of, fe	sum. res.; en.
Dark-eyed junco (*Junco hyemalis*)	br, fe, pa	wint. vis.
Tree sparrow (*Spizella arborea*)	fe, of	wint. vis.
Chipping sparrow (*Spizella passerina*)	fe, pa, a	sum. res.
Field sparrow (*Spizella pusilla*)	of, fe	ca. res.

Harris' sparrow (*Zonotrichia querula*)	br, fe, of	ca. res.
White-crowned sparrow (*Zonotrichia leucophrys*)	fe, fo	wint. vis.
Fox sparrow (*Passerella iliaca*)	fe, fo	wint. vis.
Lincoln's sparrow (*Melospiza lincolnii*)	fe, br	mig.
Swamp sparrow (*Melospiza georgiana*)	pa	wint. vis.
Song sparrow (*Melospiza melodia*)	fe, of	ca. res.

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[1] Species list and preferred habitats from Kleen and Bush (1971) and Robbins et al. (1966).

[2] Preferred habitats: cr-cropland; p-ponds; r-riparian; fo-forest; of-old fields; pa-pasture; fe-forest edge; gr-grasslands; br-brush; a-anthropogenic.

[3] Status: mig.-migrant; sum. res.-summer resident (breeds in area); wint. vis.-winter visitor; ca. res.-circumannual resident; en-endangered (state or federal); th-threatened (state or federal).

APPENDIX E

POTENTIAL MAMMALIAN SPECIES ON THE JAMESTOWN NORTH AREA[1,2]

- MARSUPIALIA
  - Didelphidae
    - Opossum (*Didelphis marsupialis*); farming areas, woodlands
- INSECTIVORA
  - Soricidae
    - Shorttail shrew (*Blarina brevicauda*); forests, grasslands
    - Least shrew (*Cryptotis parva*); open grass-covered areas
  - Talpidae
    - Eastern mole (*Scalopus aquaticus*); moist sandy loam, meadows
- CHIROPTERA
  - Vesperitilionidae
    - Little brown bat (*Myotis lucifugus*); caves, mine tunnels, hollow trees
    - [3]Gray bat (*Myotis grisescens*); caves
    - Keen bat (*Myotis keeni*); mine tunnels, caves, forests
    - [3]Indiana bat (*Myotis sodalis*); caves, hollow dead trees under loose bark
    - Silver-haired bat (*Lasionycteris noctivagans*); forested areas, buildings
    - Eastern pipistrel (*Pipistrellus subflavus*); caves, mine tunnels, wooded areas
    - Big brown bat (*Eptesicus fuscus*); caves, tunnels, trees
    - Hoary bat (*Lasiurus cinerus*); wooded areas
    - Red bat (*Lasiurus borealis*); wooded areas
    - Evening bat (*Nycticeius humeralis*); buildings, hollow trees
- CARNIVORA
  - Procyonidae
    - Raccoon (*Procyon lotor*); along streams and ponds, wooded areas
  - Mustelidae
    - Long-tailed weasel (*Mustela frenata*); all land habitats near water
    - Mink (*Mustela vison*); along streams and lakes
    - Striped skunk (*Mephitis mephitis*); semi-open country; mixed woods
  - Canidae
    - Red fox (*Vulpes fulva*); mixture of forest and open country
    - Gray fox (*Urocyon cinereoargentatus*); open forests
    - Coyote (*Canis latrans*); open woodlands
    - Domestic dog (*Canis familiaris*)
  - Felidae
    - House cat (*Felis domestica*)
- RODENTIA
  - Sciuridae
    - Woodchuck (*Marmota monax*); open woods, brushy areas
    - Eastern chipmunk (*Tamias striatus*); deciduous forests
    - Eastern gray squirrel (*Sciurus carolinensis*); hardwood forests
    - Eastern fox squirrel (*Sciurus niger*); open hardwood forests
    - Southern flying squirrel (*Glaucomys volans*); woodlots and forests

- Castoridae
  - Beaver (*Castor canadensis*); Streams or lakes with trees
- Cricetidae
  - Deer mouse (*Peromyscus maniculatus*); dry-land habitat
  - White-footed mouse (*Peromyscus leucopus*); woody or brushy areas
  - Southern bog lemming (*Synaptomys cooperi*); low damp bogs and meadows
  - Prairie vole (*Microtus ochrogaster*); open prairies, fence
  - Pine vole (*Pitymys pinetorum*); forest floor with thick duff
  - Muskrat (*Ondatra zibethica*); marshes, pond and stream edges
- Muridae
  - Norway rat (*Rattus norvegicus*); buildings, rubbish piles
  - House mouse (*Mus musculus*); buildings
- Zapodidae
  - Meadow jumping mouse (*Zapus hudsonius*); low meadows

LAGOMORPHA

- Leporidae
  - Eastern cottontail (*Sylvilagus floridanus*); heavy brush forest edges

ARTIODACTYLA

- Cervidae
  - Whitetail deer (*Odocoileus virginianus*); forest, open brushy areas

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[1] Species list from Hoffmeister and Mohr, 1957.

[2] Preferred habitats from Burt and Grossenheider, 1976.

[3] Species listed on Federal or Illinois list of endangered or threatened fauna.

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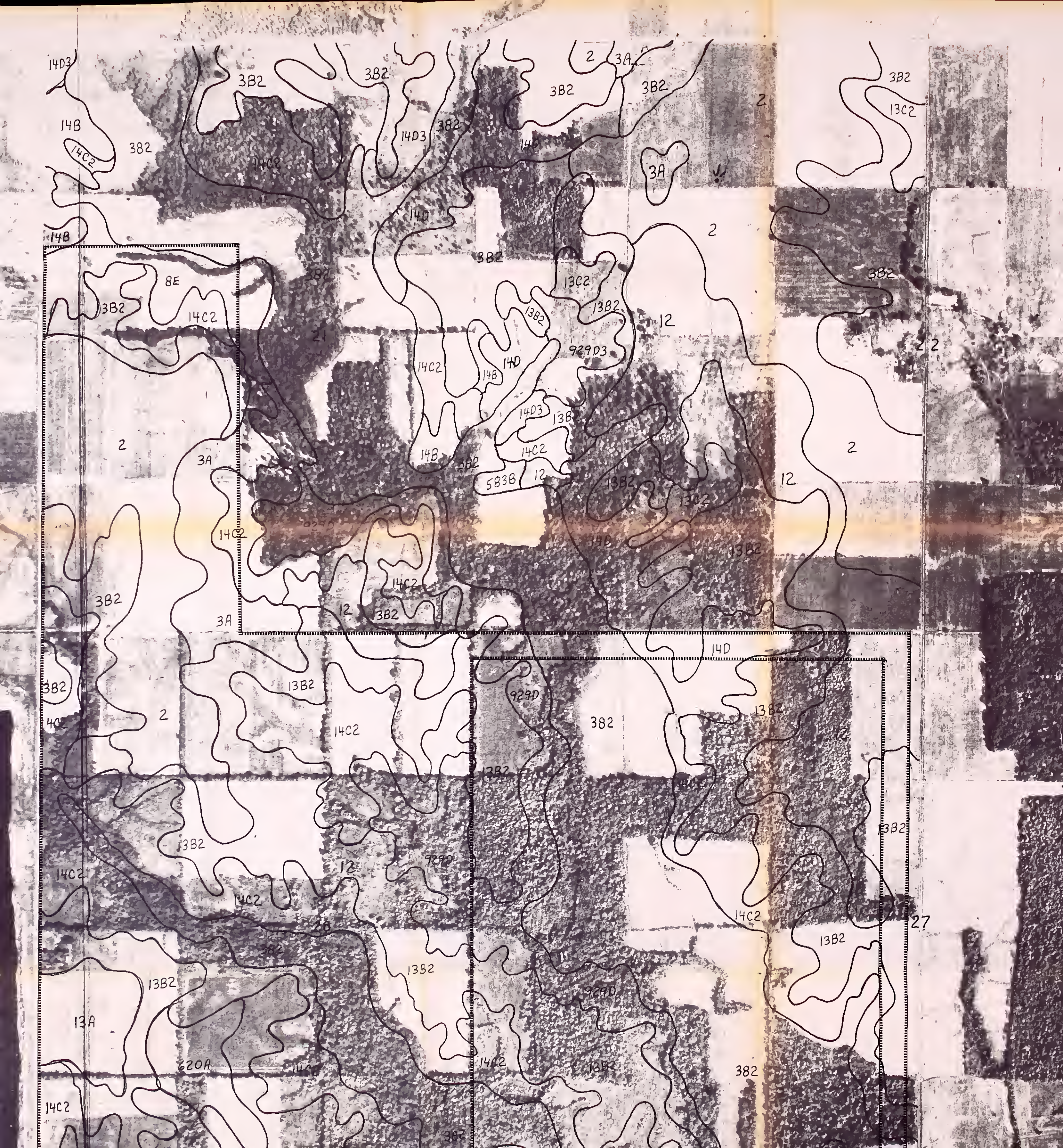
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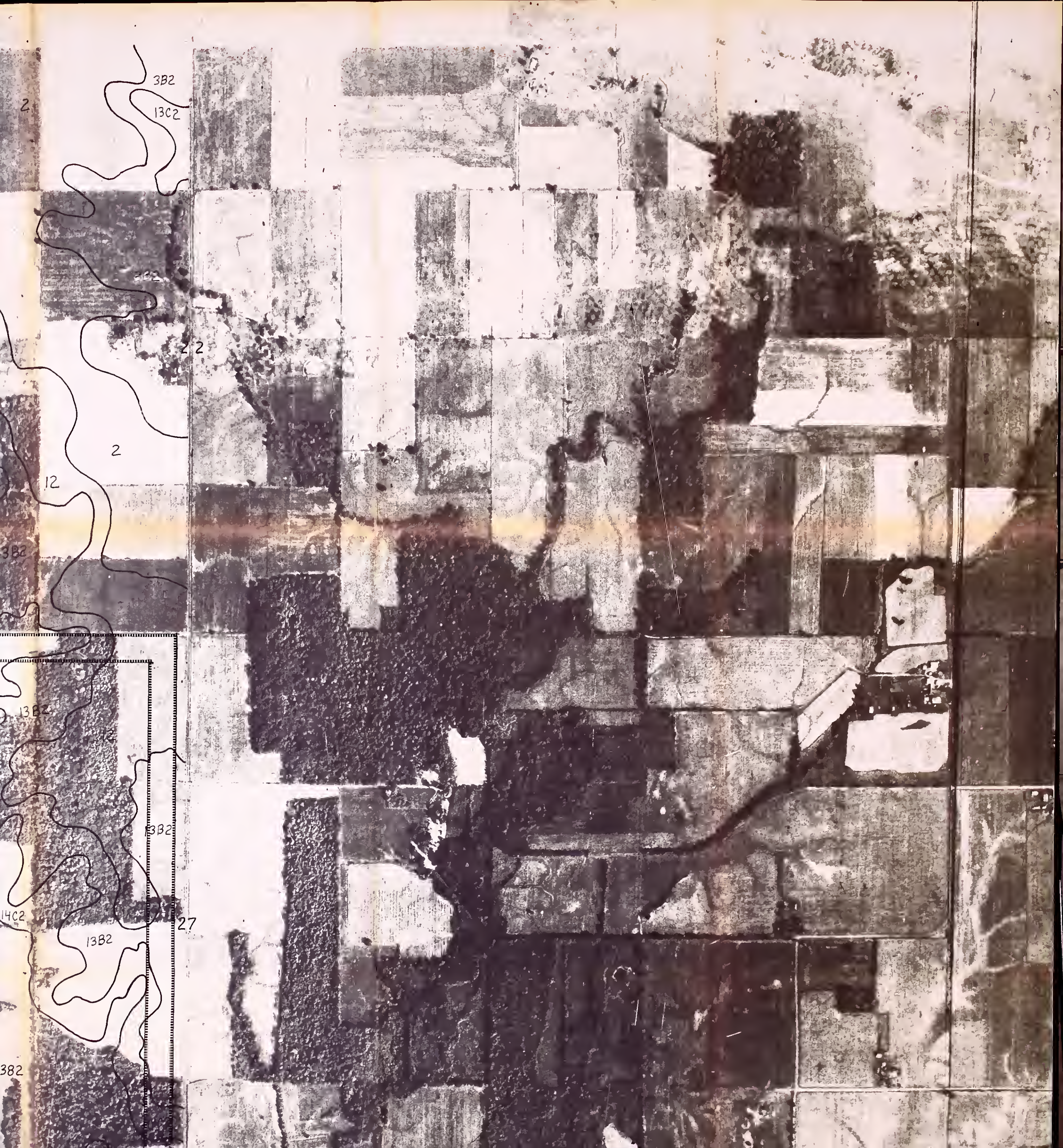
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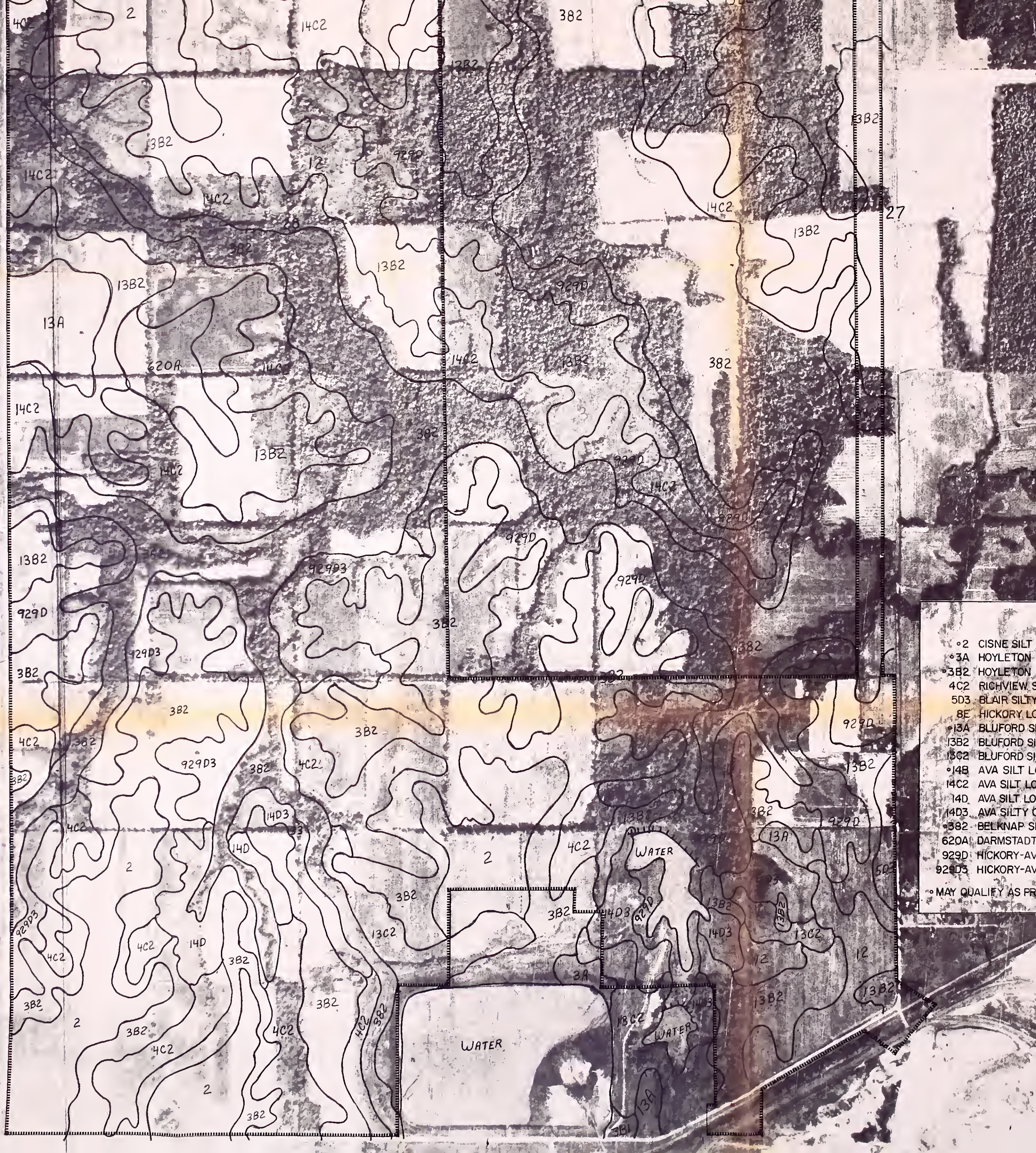
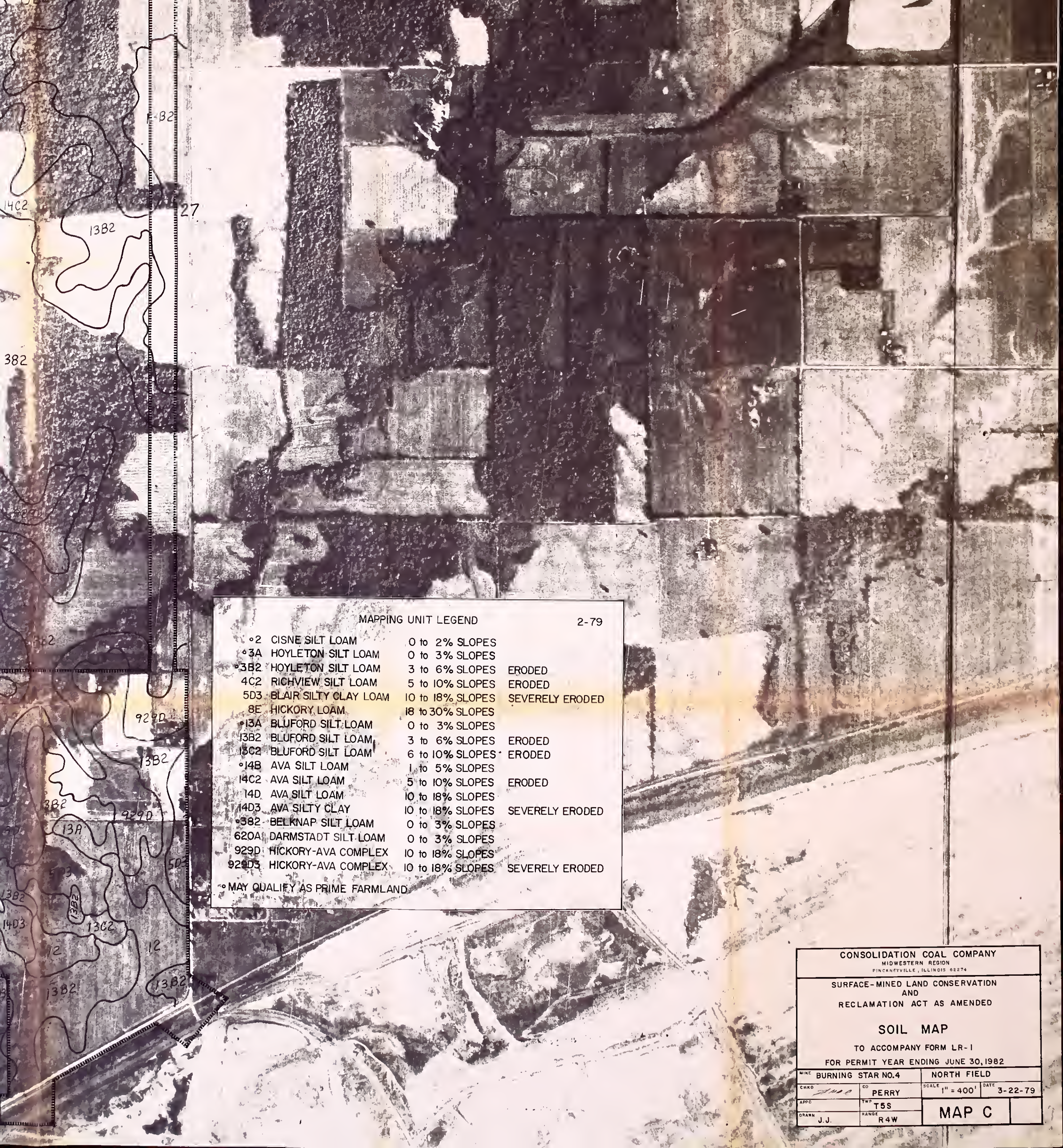


•2 CISNE SILT
•3A HOYLETON
•3B2 HOYLETON
4C2 RICHVIEW S
5D3 BLAIR SILTY
8E HICKORY LO
•13A BLUFORD SI
13B2 BLUFORD SI
13C2 BLUFORD SI
•14B AVA SILT LO
14C2 AVA SILT LO
14D AVA SILT LO
14D3 AVA SILTY C
•382 BELKNAP SI
620A DARMSTADT
929D HICKORY-AV
929D3 HICKORY-AV

° MAY QUALIFY AS PR



MAPPING UNIT LEGEND 2-79

°2	CISNE SILT LOAM	0 to 2% SLOPES	
°3A	HOYLETON SILT LOAM	0 to 3% SLOPES	
°3B2	HOYLETON SILT LOAM	3 to 6% SLOPES	ERODED
4C2	RICHVIEW SILT LOAM	5 to 10% SLOPES	ERODED
5D3	BLAIR SILTY CLAY LOAM	10 to 18% SLOPES	SEVERELY ERODED
8E	HICKORY LOAM	18 to 30% SLOPES	
°13A	BLUFORD SILT LOAM	0 to 3% SLOPES	
13B2	BLUFORD SILT LOAM	3 to 6% SLOPES	ERODED
13C2	BLUFORD SILT LOAM	6 to 10% SLOPES	ERODED
°14B	AVA SILT LOAM	1 to 5% SLOPES	
14C2	AVA SILT LOAM	5 to 10% SLOPES	ERODED
14D	AVA SILT LOAM	10 to 18% SLOPES	
14D3	AVA SILTY CLAY	10 to 18% SLOPES	SEVERELY ERODED
°382	BELKNAP SILT LOAM	0 to 3% SLOPES	
620A	DARMSTADT SILT LOAM	0 to 3% SLOPES	
929D	HICKORY-AVA COMPLEX	10 to 18% SLOPES	
929D3	HICKORY-AVA COMPLEX	10 to 18% SLOPES	SEVERELY ERODED

° MAY QUALIFY AS PRIME FARMLAND

CONSOLIDATION COAL COMPANY
MIDWESTERN REGION
PINCKNEYVILLE, ILLINOIS 62274

SURFACE-MINED LAND CONSERVATION
AND
RECLAMATION ACT AS AMENDED

SOIL MAP

TO ACCOMPANY FORM LR-1

FOR PERMIT YEAR ENDING JUNE 30, 1982

MINE BURNING STAR NO.4		NORTH FIELD	
CHKD	CO PERRY	SCALE 1" = 400'	DATE 3-22-79
APPD	TWP T5S	MAP C	
DRAWN J.J.	RANGE R4W		

LAND USE MAP

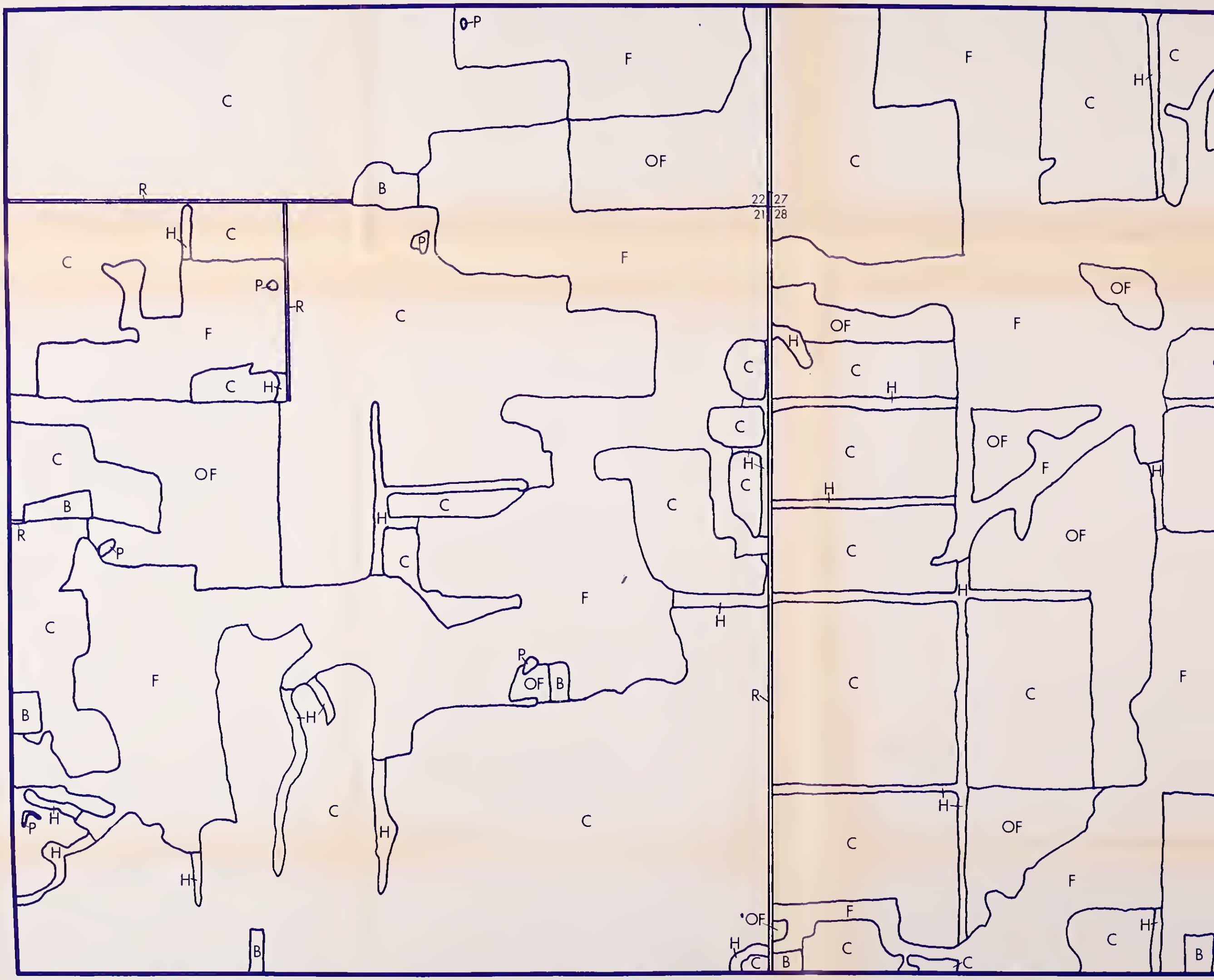
JAMESTOWN NORTH AREA

PREPARED BY CWRL SIU C

LEGEND

C – cropland
F – forest
OF – pasture–old field
H – hedgerow
P – ponds
R – roads
B – buildings–farmsteads

Perry County
T. 5 S.–R. 4 W.
SCALE
1 inch 400 feet



County
R. 4 W.
ALE
00 feet